

Scanning - Shortwave - Ham Radio  
Equipment - Computers - Antique Radio

25<sup>th</sup>  
Anniversary

# Monitoring Times

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## *DXpedition of a Lifetime* Easter Island



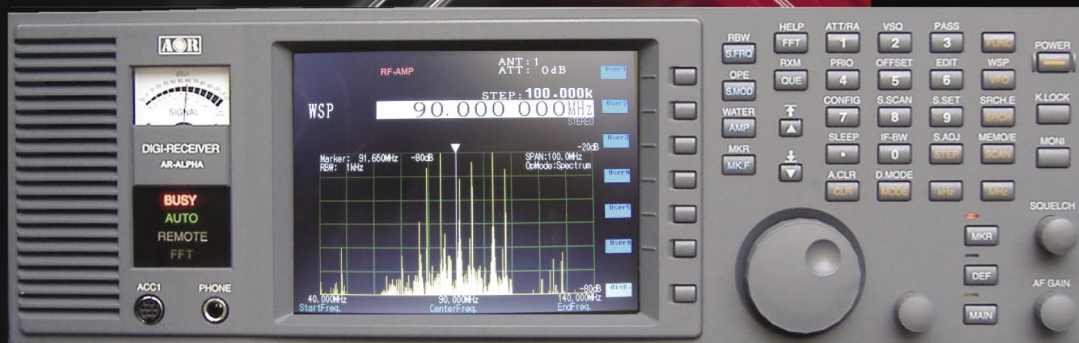
### ***In this issue:***

- Roundup of SW Programming
- Amateur Radio in the Classroom
- Back to Scanner School
- Model Motors from Scrap



# AR-ALPHA

## Communications Receiver



- Multi-mode unit capable of receiving AM (synchronous), ISB, RZ-SSB, USB, LSB, CW, WFM including FM stereo, NFM, APCO-25 digital, and TV in both NTSC and PAL formats
- 6-inch TFT color panel can display received video signals or depict spectrum activity over a wide choice of bandwidths including a "waterfall" function to show signal activity over a specified time period

## Welcome to the Future!

*AOR proudly introduces the AR-ALPHA, the first in a new class of professional monitoring receivers! Designed to cover 10KHz to 3.3GHz, with no interruptions,\* this receiver features a 6-inch color TFT display, five VFOs, 2000 alphanumeric memories that can be computer programmed as 40 banks of 50 channels, 40 search banks, a "select memory" bank of 100 frequencies, and a user designated priority channel. It includes APCO-25 digital and a DVR with six channels that can record up to a total of 52 minutes audio. Monitoring professionals will appreciate the world class engineering and attention to detail that makes the AR-ALPHA such an amazing instrument.*

- Composite video output on the rear panel of the unit
- Selectable IF bandwidths: 200 Hz, 500 Hz, 1 KHz, 3 KHz, 6 KHz, 15 KHz, 30 KHz, 100 KHz, 200 KHz and 300 KHz along with the ability to shift the IF.
- CTCSS and DCS selectable squelch functions
- DTMF tone decode
- Built-in voice-inversion descrambling
- CW pitch control, AGC, AFC
- Auto-notch feature
- User selectable spectrum display function from 250 KHz through 10 MHz in 1 KHz increments. Above 10 MHz bandwidth, it can display 20 MHz, 50 MHz, 100 MHz or 1 GHz, but above 20 MHz bandwidth, no audio will be available
- Resolution bandwidth is also user-selectable in increments of 1 KHz, 4 KHz, 32 KHz, 64 KHz, and 128 KHz.
- Fast Fourier Transform (FFT)
- Rear panel connections include 12 VDC power, RS-232C, USB 2.0, I/Q output with 1 MHz bandwidth, two antenna ports (one SO-239 and one Type N) and up to four antennas may be selected through the receiver's controls with the optional AS5000 antenna relay selector.
- Use desktop or with 19" rack mount

*The AR-ALPHA redefines excellence in professional monitoring receivers. No wonder so many monitoring professionals including government, newsrooms, laboratories, military users and more, rely on AOR.*



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*Specifications subject to change without notice or obligation.  
\*Documentation required for qualified purchasers in the USA.*



## External or internal? The choice is yours!

The latest WR-G305e (USB) and WR-G305i (PCI) are the first commercially available VHF/UHF software-defined scanning receivers. Their all-mode digital demodulator works entirely in software, with easy upgradability and high performance level typical of receivers costing many times more.

Designed for demanding applications where it is important to locate even the weakest signals in background noise and extract the cleanest audio possible. Combined with excellent hardware parameters and extensive software support, the WR-G305 series defines a new standard for communications intercept and monitoring tools.

The new optional APCO P25 Decoder makes it possible to receive unencrypted digital APCO P25 channels on your WR-G305 series receiver. See the APCO P25 spectrum in real time, analyze transmission type, determine various embedded digital codes such as NAC, TGID, SID and DID, measure bit error rate, record transmissions and listen to crystal clear decoded speech!

So which one will you choose? The external WR-G305e offering perfect portability with your laptop, or the WR-G305i which hides neatly inside your desktop PC with no extra clutter on your desk? The performance is the same - the choice is yours!

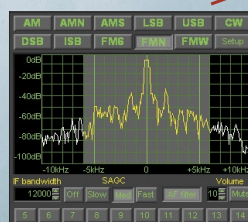
- 9 kHz-1800 MHz frequency range  
(except cellular bands where required by law)
- Optional 3500 MHz downconverter
- Tracking front-end filters
- Dual-loop AGC and AFC
- Software-defined demodulation
- Excellent sensitivity
- Fast scanning speed
- Multiple squelch modes
- Real-time spectrum analyzer
- Sweeping spectrum analyzer
- Hit counter
- Accurate S-meter
- Adjustable IF bandwidth
- Adjustable digital audio filter
- Digital communications ready
- Digital Bridge™ compatible
- Standard PCI card or USB box
- Easy "Plug and Play" installation
- Optional professional demodulator
- Optional DRM decoder
- Optional APCO P25 decoder



**WR-G305e - portable and powerful!**



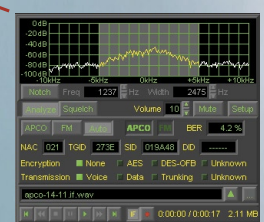
**WR-G305i - hides inside your PC!**



**Professional Demodulator Option**

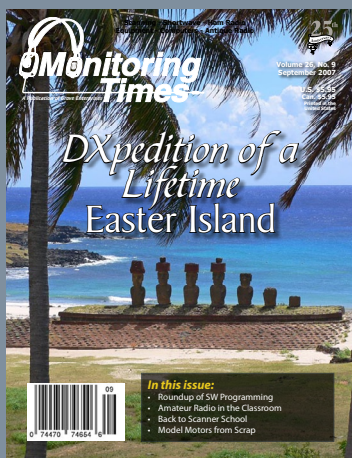


**DRM Decoder Option**



**APCO P25 Decoder Option**





## Lead Story

### DXpedition to Easter Island

By John Bryant

When John Bryant planned a trip to Easter Island, he knew he was fulfilling a life-long dream, but little did he know he was also preparing for what would turn out to be “the most memorable DXpedition of [his] long career.”

Bryant logged 235 different stations, 40 countries, and all continents except Antarctica. Not impressed? You will be when I tell you he performed this feat on MEDIUMWAVE!

Bryant’s stunning results are accompanied by equally stunning photography by Bob Bollinger. All photos, including our cover shot of Anakena Beach where Polynesian immigrants first landed over 1500 years ago, are by Bollinger. On the right: Sunset profiles Rano Raraku volcano and fifteen “moai” ancestor-figure statues.

The story begins on page 8.

## C O N T E N T S

### A Shortwave Roundup ..... 14

By Eric Bryan

Eric Bryan, who is usually found reviewing “poor man’s portables” in the pages of *MT*, decided to get out of a listening rut. We all tend to get stuck listening to what is easiest, or already programmed in the radio, or to the countries that most interest us. But what else might we be missing? Eric conducted an informal “bandscan” of the shortwave bands and compiled a sampler of the programming he found. The results prove his point: if you haven’t been tuning around, you’ve missed some delightful surprises!

### The Kids Are Alright ..... 18

By Ken Reitz

A common belief is that today’s kids are not attracted to amateur radio, but the ARRL’s “Big Project” proves that’s not so. 222 Big Project schools are introducing thousands of students to wireless technology this year, and many more schools or individual teachers sponsor radio programs on their own. Reitz introduces us to just five of these schools and their active radio clubs.

Don’t worry; the kids are alright. See if there’s a Big Project school near you: If there’s not, why not apply to start one?



## Reviews

In our continuing series of digital HD radio reviews, we check out the CAMBRIDGE SOUNDWORKS 820HD AM/FM/HD RADIO RECEIVER. With minimal design and maximum sound, Ken Reitz says the 820HD is unequalled for audio quality (see page 69).

Two of MFJ ENTERPRISES’ antenna solutions for the apartment-dwelling ham or SW listener are the 1623 and 1622 window or balcony-mount antenna. Ken Reitz puts them through their paces on

page 70. Also, John Figliozzi introduces *MT* readers to the just-announced TIVOLI AUDIO NetWorks and NetWorksGo internet radios, on page 71.

Did you know your PC can be a digital audio recorder? With the help of recording software, you can archive audio for future enjoyment, logging, or QSLing. John Catalano reviews RecAll Pro, Scancorder, Sound Recorder, Snooper, and Audacity (see page 72).





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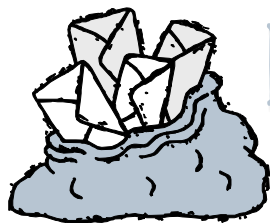
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# LETTERS TO THE EDITOR

This column is open to your considered comments. Opinions expressed here are not necessarily those of Monitoring Times. Your letters may be rephrased or shortened for length and clarity. Please mail to Letters to the Editor, 7540 Hwy 64 West, Brasstown, NC 28902, or email [editor@monitoringtimes.com](mailto:editor@monitoringtimes.com)  
Happy monitoring!  
- Rachel Baughn, KE4OPD, Editor

## Going to Great Lengths

John Musgrave, of Oona River in Northern British Columbia, recently put together a small kit for mobile, wideband monitoring. His traveling kit includes an AOR AR8200-III, 120vac wall wart, 12vdc cigarette plug and cord, Hamtronics LNK wideband preamp, 9 vdc battery, and telescoping antenna, and a UHF/BNC adapter fit snugly in a Pelican 1060 micro-case. "Light headphones and a 30ft wire antenna with a banana plug (also 3ft RG58 with BNCs) terminal carried separately complete the kit. The Pelican case slides into a large pocket."



John uses the kit for waterproof listening while in the garden or on his sailboat on the Oona River, but he also took it with him on a rare trip to Vancouver (which involves travel by a combination of plane, train, bus, and ferry). He says his attaché case included the 8200 kit, a Geiger counter, a small GPS set, an MFJ886 frequency counter, an Alphaslabs field strength meter, and a camera.



While in the garden John monitored two pilots from Hawkair discussing a new stew-

ardess. "She's an ex-model; used to model underwear. They waited 'til they were out of range of Terrace/PR as they were using the 'company freq.'" Using the wire antenna, he also received "the B.C. Public Service Net (3727 LSB). Net controller was on Saltspring Island with hams from BC, WA, and Alberta being heard."



John also comments that "These sets (AOR AR8200 and AR8600) thrive on disccone antennas, which, being inefficient below 25 MHz (with vertical frequency extender), don't overload them. At my base set-up I use the 8200 from 530 kHz up. Can occasionally receive such toughies as R. Sondergrense 3320 and Oz N Territories on 2310, 2325, 2485 kHz."

"I've received Sondergrense and the N Territories well with the 8200/preamp/Shakespeare antenna from my boat in the past week. Bear in mind that my radio rx environment is very 'clear.' No QRM at all – unless it's from my hydro-plant/load controller when operating. Plus I've salt-water grounds!"

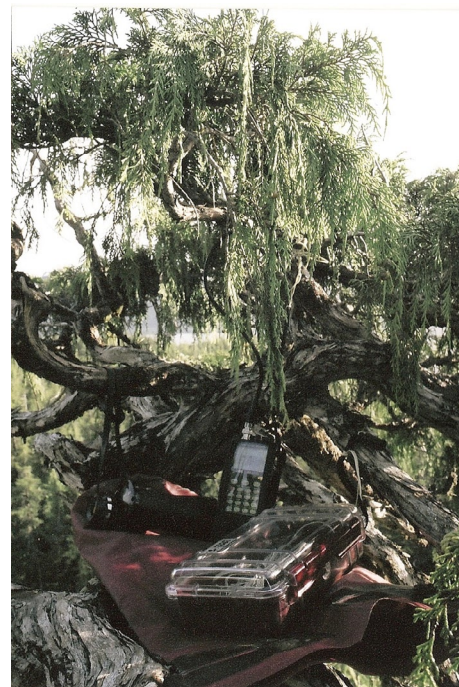
## Even Further – Up!

On May 9th, says John, "I took my '8200 kit' to tree-top (70 ft at least, probably 90) plus a camera 35mm with 35mm lens, and set up a monitoring post. Went out on a limb and took a couple of photos. 'Tree Top Monitoring' would make an interesting MT article!"

When admitting he got over-fatigued trying to maneuver his boat in ice-busting conditions and gale force winds, John wondered, "Mebbe at 71 I'm getting too old for the life I live!" But, judging by these pictures of his tree-top monitoring, we sure don't think so! (Photos to the right)

## Follow-Up on "Northern Adventure"

"The new car ferry *Northern Adventure*, which replaced the sunken *Queen of the North* (see MT's *Boats, Planes and Trains* July 2006 column) is now in service, sort of. She looks sorta cute, which is bad, 'cos cuteness doesn't count out in Hecate Straits. She had the crew which brought her over from Spain very worried off the Oregon coast – she had windows



smashed.

"Her first trip from the Queen Charlotte Is, across Hecate Straits to Prince Rupert was a near disaster. She got into 35 knot winds, the windows leaked, passengers got wet and cold (and their money back). A dry fire-extinguisher flew off a bulkhead on the car deck and went off. The fire alarm sounded, which uses the P.A. system, and no one knew how to turn it off. Crew had to rush around reassuring the passengers. Then a waste-water holding tank



flooded into the galley.

"The boat was tied up at Rupert for a couple of days – some crew quit in disgust. The boat got the nickname 'Vomit Truck' laid on her. Not a good start. (Calling a boat a truck is a great insult.)

"I called BC Ferries to find out when the next ferry South from Rupert was. A lady told me, 'Friday the 13th leaving at 1300 hours.' I told her I'd better bring my floater (survival) suit along! Which broke her up!

"*Northern Adventure* ended up going into the dock for a re-fit on May 10. Her first trip was April 1st!"

*John Musgrave, Oona River, BC*

## Monitoring Sea-Tac

In the July *Letters*, another reader from British Columbia mentioned monitoring Seattle International Airport (Sea-Tac) even though he lives about 200 miles distant. Ben Dawson sent this observation:



*Antenna site atop Gil Island (Musgrave)*

"Mr. 'George' from Saltspring Island (Colombie Britannique) could probably explain his easy monitoring of various Sea-Tac communications if he realized that he is not nearly as distant as he assumes. The most distant point of Saltspring island is only 120 miles (189 km) from the Sea-Tac reference coordinates. Isabella Point, the most southeasterly part of Saltspring, is only about 103 miles from Sea-Tac. And, of course, some of the repeater sites he evidently monitors are either elevated well above sea level (as is Sea-Tac itself, about 106 M runway elevation) or further north.

"Southwest British Columbia and the Puget Sound region of Washington State are among the most difficult places in N. America for frequency allotment and coordination from MF through microwave because of the plethora of elevated sites which can see into the "opposite" country at VHF, UHF and above, and the extensive salt-water paths which result in good MF propagation as well as dandy inversion conditions at microwave frequencies.

"An exciting place to practice telecommunications engineering!"

*Ben Dawson, P.E.*

*Hatfield & Dawson Consulting Engineers*

## Belated Footnotes

\* Reference Skip Arey's *On the Ham Bands*

July column:

"While enjoying your 'Green Shack' column, I came upon that World War II conservation slogan you quoted. Somehow your ending 'make do' didn't sound right and – being a little older than you – the real ending soon jumped into my mind – probably for the first time in a few decades!"

*Use it up, wear it out*

*Make it do or do without.*

*Marc Ellis, Radio Restorations*

\* Your editor was puzzled by Fred Waterer's reference to "those Peanuts in the Godzilla movies" in his August *Programming Spotlight* column. Fred clarified:

"They were Japanese pop singers, who appeared in a number of the Mothra and Godzilla films. In the films they were tiny fairy-like people (one website calls them priestesses of Mothra) who knew how to appeal to his goodness :-)

"Usually there is a subplot where some greedy guy decides to capture them in a box or suitcase and profit somehow. An appropriate Lizard or human hero then saves them. Pretty silly plotlines, but then it is about a monster who regularly stomps all over Tokyo.

"Brian Smith dug up some of their (legitimate) music a while back; it's actually not bad."

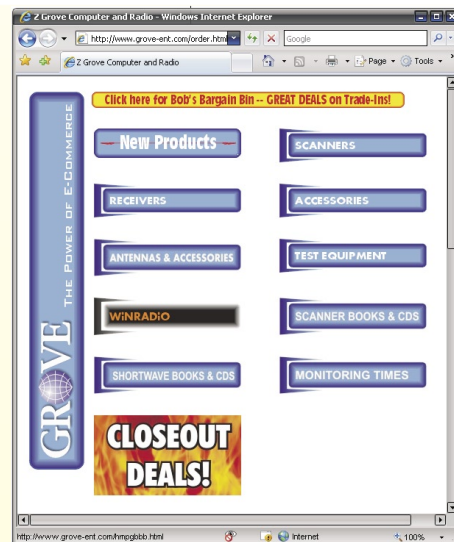
[www.godzilla monster music.com/godzilla17.htm](http://www.godzilla monster music.com/godzilla17.htm)

*Fred Waterer, Programming Spotlight*

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# COMMUNICATIONS

*"Communications" is compiled by editor Radio Baughn KE4OPD from newsclippings sent in by our readers. Thanks to this month's fine reporters: Anonymous, John McCoy, Fred Moore, Jerry None, Doug Robertson, Brian Rogers, David Thorpe, Larry Van Horn, William White, Gary Wilson*

## False Alarm

As we reported in August, a nationwide upgrade of the Emergency Alert System (EAS) is being installed by the Federal Communications Commission, along with the Federal Emergency Management Agency, the National Weather Service and the individual states. However, on June 27, morning drive-time listeners in northwestern Illinois were startled when every station was either tuned to WGN-AM 720 with morning man Spike O'Dell or was emitting the EAS tone for minutes at a time.

MT has read two explanations. Initially it was thought that equipment in Springfield was being tested and inadvertently went live. The later explanation is that a FEMA contractor was performing a closed-circuit test between Cleveland, Ohio, and Richmond, Virginia, but the Illinois system picked it up because of a new satellite receiver that had been an improperly installed the previous day.

We can only hope that as more updated systems go on line, these installations become more routine!

## Hams Part of Emergency Planning

Sgt. Tim Lotspeich of the Barstow, California, sheriff station, himself a licensed ham, watched events unfold in Katrina's wake and decided to incorporate ham radio into a new emergency-communication program in the High Desert.

"Amateur radio, at least for the first couple of days, was the only reliable communication," Lotspeich said of the Katrina disaster. "In the event of an emergency, we're really going to rely on volunteers with the proper license."

Lotspeich is recruiting Barstow amateur radio operators to volunteer as part of a emergency-communication system. He said if the sheriff's regular radio system, dependent on mountain top repeater sites across the desert, were to go down, shortwave, UHF and VHF radios would be the only way to communicate between the Trona, Baker and Barstow stations. Volunteers are needed to operate the radios, relaying and receiving communications, while the sheriff's deputies assist with the emergency on the ground.

## Federal Court Denies Webcaster Appeal

MT has continued to follow the webcasters versus copyright royalties debate with interest as it takes on all the drama of a *High Noon* showdown. First, new rates were estab-

lished (to take effect May 15) but webcasters – especially the small and non-profits – said the rates would put them out of business. Webcasters appealed to the Copyright Arbitration Royalty Panel and lost. They appealed to Congress and staged a "day of silence" to enlist the aid of the public. They appealed to the U.S. Court of Appeals for the District of Columbia Circuit and lost. Their temporary stay expired July 15.

Are they now off the air? No, because SoundExchange, which represents musicians and performers, offered to extend the old rates until an agreement can be worked out and has agreed to a \$50,000 cap on per-channel fees. Orchestrating negotiations between the coalition of webcasters and the musicians' representatives is none other than Rep. Edward Markey who holds Bill Tauzin's former spot as chairman of the Telecommunications and Internet Sub-committee.

Now, however, it appears there were some sticky "strings" attached to the reprieve. This new facet of "radio" continues to evolve!

## BULLETIN BOARD

### Aug 31-Sep 2: Shelby, NC

51st Shelby Hamfest at Cleveland County Fairgrounds (3-1/2 mi east of Shelby on US74), 7a.m. daily, \$6 admission, good all 3 days. Talk-in 146.28/88. [www.shelbyhamfest.org](http://www.shelbyhamfest.org)

### Sep 8: Lowell, MI

GRAHamfest 2007 (Grand Rapids Area Hamfest) at Kent County Fairgrounds (Hwy I-96 exit #52, north 4 miles). 8a.m.-1p.m., adm \$6. Talk-in 147.26+ (94.8 Hz) and 146.52 simp. Contact Jack Amheler NY8D [www.grahamfest.org](http://www.grahamfest.org) 616-897-6885

### Sep 15: Special Event Station K5R

Commemorating the anniversaries of hurricanes Katrina and Rita. 1400-2000 UTC on 14.250 and 7.250 MHz +/- QRM <http://groups.yahoo.com/group/K5R>

### Sep 16: Newtown, CT

Western CT Hamfest at Edmund Town Hall (45 Main Street, Route 6, Newtown), 8:30a.m.-12:30p.m., Admission \$5. Talk-in 147.300 PL 100.0. Contact Joe de Groot AB1DO, 203-938-4880.

### Sep 29-30: Belvidere, IL

Chicago FM Club Radio Expo 2007 at Boone county Fairgrounds (Rts BR20 & 76) Sat 8am-4pm, Sun 8am-3pm, adm \$10 good both days/ Talk-in 146.76- (107.2Hz)/ 147.255+ (114.8Hz)/ 444.725+ (114.8Hz). Contact 708-457-0966 or [www.chicagofmclub.org](http://www.chicagofmclub.org)

## Broadcast Detachment

### Transfers AFN Command

The 356th Broadcast Operations Detachment from Fort Meade, Md., arrived in Kuwait July 12, 2006, and spent the year operating the American Forces Network station in Baghdad. While there, members of the 356th broadcast more than 3,500 hours of live radio and filmed 250 episodes of *Freedom Journal Iraq*.

On July 2, 2007, command of AFN Iraq was turned over to a detachment of U.S. airmen partnered with a detachment of U.S. sailors, the Defense Department reported.

After more than 100 missions outside the International Zone, we know these members of the National Guard are glad to be back home!

## A First, Even for Russia

During the 1990s, a lot of infrastructure and land was privatized in the Russian Federation. However, the federal government is now trying to reverse the trend by consolidating the assets of several government agencies.

In Bashkiria, a Russian Republic north of Mongolia, the Russian TV-Radio-Broadcasting Network (RTRS) is in dispute with Bashinformsvyaz (a major telephone/Internet/data operator in Bashkiria) over a broadcasting complex in Ufa. RTRS is trying to reclaim a broadcasting complex which, according to the Russian president's decree, was to have passed back to the federal agency in 2001.

Though the case is still in court, Bashinformsvyaz took the unusual step of ordering four 200-meter-high radio broadcasting towers on the property blown up. One legal consultant said, "Blowing up the infrastructure elements is an unprecedented-for-Russia but perhaps effective way to change the status of a real estate object: in this case – from the status of a building and a broadcasting facility to a common land plot."

The RV-1 broadcasting complex included radio transmitters (earlier used by Radio Rossii and Mayak), the four blown-up towers, several buildings, and a land plot of 70 hectares. Although Bashinformsvyaz has won part of the property dispute, one expert predicted that, "Ahead of the 2008 presidential election, the state will definitely try not to allow Russia's broadcasting infrastructure to de-centralize. Thus, the state might take RTRS' side in the dispute."

## Build a Better Battery

The Pentagon is offering \$1 million to any team that can cut the weight of batteries carried by US soldiers in combat from more than 20 pounds to 4 kilograms (8.8 pounds) or less. The wearable power system must provide 20 watts or power over 96 hours. The competition, dubbed a "wear off," will take place in the fall of 2008.



## OBITUARIES

### Lady Bird, Radio Owner

The former First Lady, widow of Lyndon Johnson, passed away July 11 at age 94. Lady Bird was also involved in the world of radio thanks to her purchase in 1942 of KTBC(AM) in Austin, with part of her inheritance, the *New York Times* reports in its obituary.

"Although the station was bought in Mrs. Johnson's name, her husband's political influence, even though limited at the time, helped in acquiring the license from the FCC," the *Times* recounted. "Johnson became the commission's champion at a time when Congress was about to cut its budget. Mrs. Johnson's application was speedily approved."

Incidentally, Lady Bird Johnson was protected by the United States Secret Service for forty-four years, longer than anyone else in history.

### Jean Marius Novi WB4ENI

Jean Marius Novi was one of the hams who provided vital emergency communications after Air Florida Flight 90 crashed into the 14th Street Bridge on Jan. 13, 1982, during a bitter snowstorm. Mr. Novi was cited for the four days in which he assisted in engineering a phone patch and volunteering services and equipment.

Ham radio was only one field in which he was involved in communications and international understanding. Mr. Novi worked as an interpreter of English, French, Spanish, Portuguese and Italian. His assignments took him to conferences, boardrooms and governmental organizations worldwide. He dealt with a range of subjects, including finance and business, medicine and health, energy and engineering, and arts and literature. Novi organized French interpreters for three Olympics and for 6 years was involved in the International Criminal Tribunal for the former Yugoslavia in The Hague.

Novi died at age 62 of sepsis June 19 at Georgetown University Hospital.

### Prime Time Shortwave

Daniel Sampson, owner of Prime Time shortwave, has announced he will discontinue the English shortwave schedules database as of the fall-winter broadcasting season, October 28.

Schedules will continue to be posted at the Prime Time Shortwave website after the A-07 season, but they will not be entered in a database, nor will they be as comprehensive. The newsletter will be continued, but not the ascii text files.

"I have been doing the shortwave schedules database for something like 22 years," says Sampson. "As for why I am discontinuing doing the database, increasing responsibilities with the family, church council, committees, other website work, being a land owner, and my full-time job are getting to be too great. It's making it difficult for me to keep up the quality work on it that I feel is necessary."

Maintaining a database is truly a labor of love—often a thankless one. So, we'd like to take this opportunity to thank you, Daniel, on behalf of the hobby. **Newsbreak:** In a last-minute reprieve, Ernest Riley, who writes for the Ontario DX Association publication *Listening In*, has volunteered to take over operation of *Primetime Shortwave*. Great news!

*Monitoring Times* is grateful for the co-operation between Prime Time and our own database manager, Gayle Van Horn (who has been managing *MT's SW Guide* for a "mere" 14 years). *Monitoring Times* is now nearly unique in maintaining a regularly-updated shortwave database file of English language broadcasts.

## Longwave Resources

✓ **Sounds of Longwave** CD or Audio Cassette (please specify) featuring WWVB, Omega, Whistlers, Beacons, European Broadcasters, and more!  
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# Medium Wave DXpedition to Easter Island

By John H. Bryant

All photos by Bob Bollinger, Stillwater, OK

**R**ecently, I was able to fulfill a lifelong dream and visit fabled Easter Island in the southeastern Pacific. Although my primary purpose was to visit the myriad of archeological sites, view the hundreds of giant stone heads, and get to know the inhabitants of this “most isolated community in the world,” I could not possibly visit such an exotic location without testing its potential as a location for very long-range *medium wave* DXing. Since the nearest concentrations of MW broadcasters to Easter Island were on the west coast of South America, 2300 miles to the east, and in New Zealand, 4300 miles to the southwest, there was every likelihood that Easter Island might be a prime DX location.

Easter Island, a special political component of Chile, is a triangular volcanic island measuring about ten miles on a side. The 3300 inhabitants are concentrated in a single village, Hanga-roa, on the southwest corner of the island, which is also the only location of an AC power grid on the island. Getting to Easter Island is now relatively easy: an overnight flight from the USA to Santiago, Chile, followed by a 5-hour jet flight straight out into the otherwise empty eastern reaches of the South Pacific Ocean.

Even though Easter Island lies so far west off the coast of South America, it was a real surprise to discover that the island is on what we Norte Americanos know as Mountain Standard Time! We tend to think of our continent as being stacked directly atop South America, but an examination of a globe reveals that the western coast of South America is offset to our east over 2000 miles! Travelers from the USA suffer no classic jetlag at all, but 24 hours of continuous flights and airports can still be quite brutal.

## Planning

As I planned the trip, I knew that I would be 12 volt DXing from a rental car. Since I was also quite concerned about luggage weight and passing through modern security screening, my DXing equipment choices were both critical and limited. After a good deal of thought, I chose the marvelous Eton E1-XM as my primary receiver and the small Kaito KA1103 as back-up; the Eton E1-XM had recently supplanted my long cherished Sony 2010 as my favorite DXing portable. I was not disappointed in either receiver!

In my many years of seaside DXing, I’ve never found an antenna that performed as well



*In an attempt to assure DXing success, Author John Bryant and photographer Bob Bollinger put on hiking headlamps and scaled the Rano Raraku volcanic cone. Rano Raraku is also the site of the quarry for all but a few of the giant moai heads for which Easter Island is known.*

as a Beverage, so I selected two 500-foot wires as my antennas; weight and bulk concerns led me to adopt the Beverage-On-the-Ground (BOG) configuration and a very light 28-gauge, Teflon-coated wire. I was concerned about the BOG configuration and using such tiny wire; but again, I was not disappointed.

The DX travel kit was rounded out with my favorite full-size headphones, a magnificent Edirol R-09 digital audio recorder and my trusty *WRTH (World Radio TV Handbook)*.

As I planned the DXpedition, I anticipated hearing quite a few coastal South American stations from an Easter Island location; I also expected to hear a decent number of New Zealand broadcasters mixing with a few of the stronger Australians. I also eagerly anticipated hearing a number of stations from the island



*Ahu Tongariki with its ancestor-figure moai statues is a careful restoration of the largest and most populated ahu ever created by the ancient Polynesian inhabitants of Easter Island. Finished moai statues did not look out to sea as is the popular Western misconception. They were mounted on ahu platforms at the edge of the sea and gazed inland to overlook the nearby village of their descendants.*



nations of the Pacific.

Since my friend, well-known South American DXer Rocco Cotroneo, had recently heard several of the largest Japanese MW stations from the Chilean coast, I, too, hoped to hear the biggest of the NHK stations, from twice as far away as from my favorite haunts at Grayland, WA, USA.

## The Challenge

The distances involved in Pacific-based DXing are enormous. With the 2,400 mile width of the USA in mind, the distances from Easter Island to anywhere else are simply staggering: it is 2,300 miles to Chile, 4,300 miles to New Zealand and 5,300 miles to the nearest edge of Australia. Most of the US, including the Hawaiian Islands, is about as distant as eastern Australia: 5,300 miles.

These are the “close-in” locations; beyond them, distances get truly planetary: Western Europe and Japan are about 8,500 miles away, while coastal China lays out at 9,500. To go beyond that distance at MW frequencies is simply unthinkable.

I planned my two-week stay on the Island to include four all-night DX sessions on the local Friday and Saturday nights, with one three-hour, early evening introductory session ahead of the first weekend and two similar sunset DX sessions during the intervening week. That schedule proved very workable and was followed closely.

My DX shack turned out to be a small Japanese SUV, ruggedized and adapted to the rutted and rock-strewn gullies that are laughably called “main roads” outside of Hangaroa village.

My location on the island, except for the first familiarization session, was near the Te Peu archeological site on the upper portion of the northwest shore. This was as far north of Hangaroa (about 6 miles) as the “road” ran. Since none of the more popular archeological sites were nearby and the road was so poor, the site was about as isolated – both electrically and physically – as possible.

The spot that I chose was on a plateau atop a 200 foot northwest-facing cliff, looking out across the broad Pacific into quite magnificent sunsets. I ran one antenna due west, unterminated, directly to the cliff, 480 feet away. That antenna was used, directly, for all Pacific DX and used “over the shoulder” for South America. The second BOG ran due north, pointing at Central and North America.

## Early Results

The DX during my first familiarization evening session was about what I expected: I started at 0039 UTC, almost an hour before local sunset, and I found the MW dial covered with either carriers or audio from South America. The only surprise that evening was from how far north many of the signals were

coming: my first logged station was Radio Programmas del Peru-730 kHz, Lima, that was just booming in almost an hour before the sun dipped into the South Pacific. That logging was closely followed by Radio San Francisco-850 kHz Guayaquil, Ecuador, practically off the side of my E-W Beverage, booming in as well. The rest of that evening followed suit.

By sunset, there was what seemed to be South American audio on almost every channel from 540 to 1700 kHz. I logged a number of Argentine stations, especially above 1600 kHz, and what seemed to be every station on the air in either Lima or Guayaquil.

During my pre-trip research, I had noted that almost the entire island was “open range,” with semi-domesticated animals wandering about freely, even in the village of Hangaroa.



It seemed kind of pleasant during that first evening of DXing to notice beautiful roosters and hens pecking their way past the DX truck in the gathering twilight. They were direct descendants of Polynesian fowl brought in the ocean-spanning canoes with the original colonists 1500 years ago. Charming!

It also seemed somehow rustically appropriate when a herd of 18 to 20 horses, introduced over 100 years ago by Chilean ranchers, came wandering down the main “road” past the DX site, just before full dark. At that point, I did not anticipate some of the special thrills that DXing in Open Range can offer. You’d think that someone like me who was raised on the prairies of Oklahoma and Texas would know better.

*Since AC power was only available in the village of Hangaroa and fearing being stranded by a dead car battery at such a remote location, Bryant relied exclusively on battery-powered radios and peripheral equipment. Working light was provided by a multi-LED hikers headlamp.*

## Awesome DX

During that first introductory evening of DXing, I noted that there was already DX on the band when I turned on an hour before sunset, at 0030 UTC; I decided to begin all other sessions at 0000 UTC, fully 90 minutes before sundown. So, on that first Friday afternoon, I had the antennas out and my set-up primed to go at 0000UTC.

When I flipped the switch, I began the most surprising and thrilling DX session of my 53-year DX career. Fourteen non-stop hours later, I realized that I’d found the Mother of All DX Locations. In one night, I logged all continents, 22 countries and 122 stations... all but a few were IDed by station ID or by parallels.

I managed to log 15 IDed Kiwi and Aussie stations in 45 minutes. I wasn’t trying for a speed record, but since I’m not going to report for QSLs, all I had to do was positively ID them. The conditions were absolutely fabulous: in that one night, I logged from Egypt clear around to India (YES!).

During that single night, I also logged 70 stations from Australia and New Zealand combined. The best receptions of that first full night were hearing my only Brazilian, Radio Tupi, 1280 kHz, in Rio, my first from Europe/Mid. East/N.Africa, Algeria’s ENRS1-531 kHz, and hearing 1566, AIR Nagpur for 20 minutes, including a full EE ID and the 5 minute EE news that followed. I had no idea that the whole world would be





open to me *on medium wave*, from isolated Easter Island!

## Spooky Visitors

What I have not admitted until now to anyone was that I got scared darn near out of my mind that night, too. I've never been totally comfortable DXing by myself at an isolated location, surrounded only by a small vehicle and in the pitch black dark. Unfortunately, I've also proven to myself that I hear DX much better with earphones, especially the fully-sealed variety that block out all ambient noise. On dark nights, alone, wearing those headphones, there is no chance to hear if anybody or *anything* approaches.

On that first moonless night, about 2:30a. m. in the pitch black dark, I could have sworn that I heard something just outside the vehicle! I ripped off the 'phones and there was nothing there. Paranoid as usual. Four or five minutes later, I swore that I heard a couple of heavy footsteps! Off came the 'phones: nothing!! Ten minutes later, I was CERTAIN that I heard heavy breathing; off came the 'phones... nothing!

This time, I reached over and flipped on the headlights. The mini-SUV was surrounded by eight or ten horses, each peering in through the open windows, their noses not 3 feet from the vehicle! Had one of those obviously curious horses stuck his muzzle in the open car window to give me a lick... or just whinnied loudly, I'm certain that I would have had the heart attack to end it all! Wow! Isn't DXing fun?

## It Just Gets Better

The remaining three all-night DX sessions followed very much the same pattern as the first, though with a bit less assistance from the local free range barnyard. Carriers from Europe, North Africa, and the Middle East would appear about 90 minutes before local sunset, on the 9-kilohertz spacing. There would also be a few "early bird" South American carriers or low audio about the same time. At 60 minutes before sunset, audio from Europe, et al., would arrive.

Most of those signals would be only moderate level, but some of the Spanish and some of the Middle Eastern signals were startlingly strong. The really long-haul signals were pretty much gone by the time the sun touched the horizon at 0130, but by then South Americans crowded the dial.

By 0230, full dark, a few signals from eastern North America began to shoulder aside many of the South Americans. In the next two hours, the spotlight seemed to travel rather swiftly westward across the United States, with Cleveland and Charlotte being followed by Chicago and St. Louis and then by Denver, Salt Lake City, and Albuquerque.

By 0500, the spotlight swung to the US West Coast, with the large majority of the stations being heard from central and southern parts of California. Indeed, there was at least some California presence from about 0500 until 1330 UTC dawn on Easter Island. For

reasons that I don't begin to understand, the strongest (like a local!) station from California was 1530, kHz, KFBK, Sacramento, which far out-shone the more southerly California stations, high band or low.

By the middle of the local night at 0730 UTC, the New Zealand stations would begin to appear on the 9 kHz channels, with the Aussies joining the mix by 0900 hours. Although a few Japanese appeared as early as 0830, they were mostly logged during the local pre-dawn 1200-1300 time span.

One of the biggest surprises of the DXpedition was the absolute dominance of Chinese stations during the 30 minutes before and after the 1330 local sunrise on Easter Island. Chinese stations – LOTS of Chinese stations – traveled more than 9500 miles to populate the band during dawn enhancement! Things got so busy on the best Chinese dawn, March 24, that I was forced to choose between noting the presence of all of the Chinese signals on the band or taking the time to identify just a few and ignoring the rest. Since the presence of so many extraordinarily long distance signals seemed more important than the exact identity of a few, for the first time in my life, I just IDed the language positively, noted "UNID CC station" and moved on.

Each of the all-night sessions closed out with one extraordinary signal lasting long after the other signals faded out ... and long after dawn. The first of these began with me innocently listening to 1566, HLAZ, the super-power Christian broadcaster from South Korea. HLAZ often lasts long after dawn at our Grayland, Washington, site, and it was doing quite well 40 minutes after dawn on March 17<sup>th</sup>.

Soon, I noticed something beneath HLAZ; as this second signal built, it certainly sounded like Hindi and I remembered that AIR Nagpur on 1566 had been heard by Patrick Martin on the Oregon Coast and was one of our "Holy Grail" targets at Grayland. As the signal rose to eventually dominate 1566, it did prove to be All India Radio, Nagpur, over 11,700 miles away!

The following evening, the magical pre-sunset hour was highlighted by the first of several receptions of Radio Farda-1575 broadcasting to Iran from the United Arab Emirates, a distance of 11,400 miles from my Easter Island cliff-side QTH. The reception was made even more memorable by the content of the

*John Bryant holds his now-beloved Eton E1-XM along with the reel of 28 gauge Teflon-coated antenna wire that provided two 500-foot long Beverage antennas, laid directly on the ground. The background is the outer slope of the Rano Raraku volcanic cone, the quarry for the famous moai heads of Easter Island.*

pop music program: a Michael Jackson tune followed by some Rap music in Farsi. That must drive the Iranian authorities crazy; it sure does it for me!

That second all-nighter was closed out with another extraordinary reception. Well after dawn (and time to try again for Nagpur on 1566) on my way up the dial, I noticed an unusual signal on 1413: it sounded (and was) Hindi, and I was fascinated. Checking in the East Asia-Pacific section of *WRTH*, I could find no major station on 1413 that ought to be transmitting Hindi at that hour. The Hindi talk-programming contained a few English words mixed in the conversation (not unusual in itself), and then there was one full interview in very British English about cricket. Wow!

I kept listening, hoping for a station identification... and then I heard a website given out: it was something like "hindi.bbc.uk." A light bulb lit: 1413 is the MW frequency for the huge BBC Oman Relay Station! Sure enough, their schedule shows an hour of Hindi, beamed eastward to India (and directly at far-off Easter Island) at the proper hour. Further listening on subsequent mornings proved beyond a doubt that I was hearing the Oman Relay Station, from well over 13,350 miles away.

If you combine the reception of Radio Farda-1575 kHz, heard before sunset (11,400 miles) with the BBC-Oman reception, long-path and post-sunrise (13,350 miles), I was able to more than circle the globe in a single DX session, *on medium wave*. I never imagined that would be possible and I felt extraordinarily privileged.





## A Taste of Reality

The all-night DX sessions continued to be accompanied by visits from the local free range horses and cows, though no session was quite as frightening as that first one. The second Saturday night, I decided to get about three hours of sleep there in the car seat, before the Kiwi stations faded in. I did lock the doors, but the night was too warm to roll up the windows. Naturally the horse herd waited until I was sound asleep and then stampeded right past the vehicle. I could almost hear them giggling as they thundered past! Luckily neither the coax lead-in nor the very fragile antennas were caught up in the stampede.

I was very conscious that the most memorable DXpedition of my long career was coming to a close as I set up the equipment late the next (and last) afternoon. I will admit that I had a premonition as I was laying out the Beverages that last time: I saw the horse herd about a kilometer away in one of the high pastures on the side of the volcano. Well, things started out quite normally; the European and Middle Eastern signals seemed fewer and weaker than past evenings, but heck, anything from 9,000 miles away on medium wave is remarkable!

After about 45 minutes of very good DX-ing, but well before dark, the local horse herd invaded my antenna farm once again. Even though I grew up in North America's largest pasture, the South Prairie, I was not excited about getting out of the vehicle and mixing with the herd; however, it WAS the last night and I had to save those antennas, so I tried to shoo them away with my best cowboy imitation. I was having some success, but then it became obvious that the number one stallion was feeling very amorous... and I retreated to the DX truck in a hurry!

Still before dark, the stallion and his filly of the evening managed to consummate their love right at the far end of my east/west Bev-

erage.... Thankfully, the honeymoon couple was over a little rise, so I could only see their heads and necks; and it *was* getting dark, so equine modesty was largely preserved.

Later inspection of the E-W wire by flashlight showed that I was really lucky... the wire was only slightly damaged. I did notice throughout the night that the North wire wasn't working too well. When I reeled the Beverages in after dawn, I discovered that the herd, while acting as a chorus for the amorous couple, had managed to cut the N-S wire at about the 200 foot mark. There are all sorts of problems when you deploy long BOG antennas in a free range area that is heavily populated by horses, cows and chickens!

## Reliving the Memories

As I flew back to North America, I tried to sum up what will certainly be my most memorable DXpedition. The final all-session count was 235 different stations logged, in 40 countries, on all continents except nearby Antarctica. As we winged our way north over coastal Ecuador, I tried to make a list of my most memorable catches, arranging them by continents. Probably the most memorable European station was a still "tentative" reception of Ireland, RTE Radio 1, on 567 in Tulamore.

Certainly the most memorable Middle Eastern receptions were the "Around the World" pair of short-path Radio Farda-1575 in UAE before sunset, followed 14 hours later by long-path BBC Oman Relay on 1413 kHz, after sunrise.

My only Africans were rather large national stations in Egypt, Algeria and Morocco, but they were each memorable, too. In North America, it was surprising that I did not hear any Canadians; I'd guess that my most memorable US stations were two from New York City, WFAN-660 and WBBR-1130 along with

the very much smaller stations, WTBN-570, Pinellas Park, FL, and WCNZ-1650, Cedar Falls, Iowa.

It was even more difficult to select the most memorable catches from South America. If pressed, I'd probably select my only Brazilian, Radio Tupi in Rio on 1280 kHz, which boomed in on two different nights; but then there is that unidentified station on 530 kHz that I heard one night simulcasting BBC World Service. About the only station that can be is Falkland Island Radio Service, and the programming seems to fit their published schedule.

Unfortunately, The Down Under radio scene is much like the MW band in the US: dominated by large networks and groups of stations and carrying just a few syndicated programs – not a very memorable radio scene. Two of the few determinedly independent stations Down Under were most memorable for me: Australia's 4CC-927 in Gladstone, Queensland, and New Zealand's tiny "More FM" operating on 531 kHz, from Alexandra in the far interior of the South Island.

Although I heard many "old friends" from Japan and more Chinese stations in four dawns than I have in 20 years of at least sporadic DXing from Washington state, by far my most memorable moment on the DXpedition was (after being sure that the 1566-Hindi station had faded out before station break) when I heard the announcer in Delhi suddenly say "All India Radio. Here is the News read by..."

I would especially like to express my appreciation to numerous senior members of the MW DX community who helped me in the planning of this DXpedition and in identifying many of the stations heard during those thrilling DX sessions. Without their help, so freely given, this experience would have been ever so much less enjoyable and productive. I should also add that, as wonderful as the DX was, the scenery, the monuments, the archaeological sites almost without number and the extraordinarily friendly inhabitants of Easter Island were even more memorable than the DX. My visit to Easter Island was truly the most fun that I've ever had with my clothes on!

## Easter Island Loggings by Country March 16 - 25, 2007

### STATION TOTALS

#### Europe, Middle East and North Africa:

21 stations in 13 countries: Spain (7), Egypt (2), Saudi Arabia (2), Algeria, Eire(p), Bosnia(p), Morocco, Netherlands, Portugal, Syria, France, Oman and UAE.

#### East and South Asia:

68 stations in 8 countries: China (40), Japan (18), Philippines (3), South Korea (3), North Korea, Taiwan(t), India and Thailand.

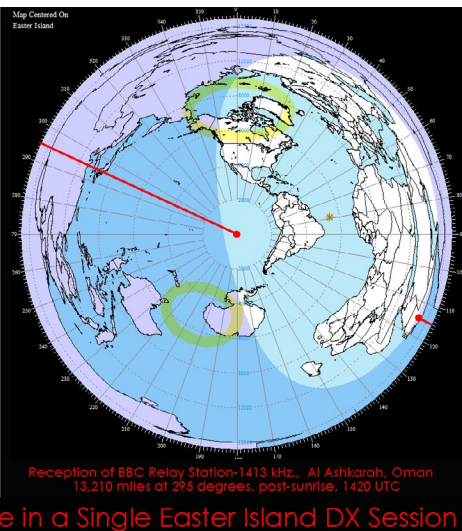
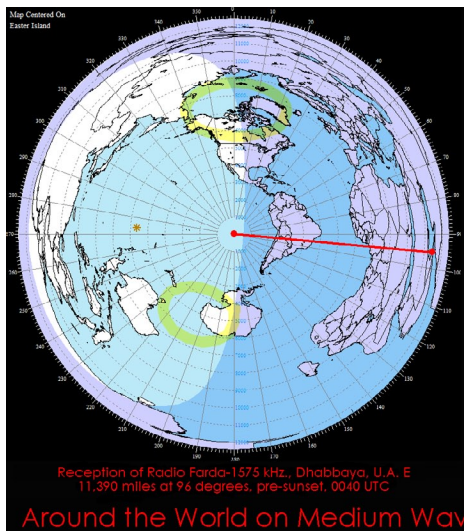
#### Pacific:

72 stations in 6 countries: New Zealand (36), Australia (32) Fiji, Hawaii, Tahiti and Tonga



*To escape the electrical noise of Hangaroa and find a suitable location for a fan of 500-foot Beverage antennas, John Bryant rented a small ruggedized SUV and traveled to the furthest reach of nearly impassable roads to the Te Peu DX site.*





## Around the World on Medium Wave in a Single Easter Island DX Session

### North and Central America:

46 stations in 7 countries: USA (35), Mexico (5), St.Kitts & Nevis (2), Turks & Caicos, Cuba, Netherlands Antilles and the Virgin Islands

### South America:

32 stations in 6 countries: Peru (15), Argentina (9), Ecuador (4), Brazil, Chile and the Falkland Islands

## EUROPE, M.E. & N.AFRICA

531 ALGERIA ENRS1, Ain El-Beida, 0100  
567 EIRE RTE1, Tulamore, (t) 0157  
585 SPAIN RNE1 Madrid, 0105  
612 BOS-HERZ. B-H R. 1, Sarajevo(t), 0103  
621 SPAIN RNE1 Synchros, 0205  
684 SPAIN RNE1, Sevilla, 0101  
711 SPAIN COPE, Murcia (pres.), 0103  
711 MOROCCO RTM, Laayoune (pres.), 2231  
738 SPAIN RNE1 Barcelona, Mar 18 0104  
747 SPAIN RNE5 Synchros, Mar 17 0114  
747 NETHERLANDS R. 5, Flevoland, 0125  
774 EGYPT ERTU M-E Prg., Abis (pres.), 0120  
783 PORTUGAL R. Nacional, Avanca, 0038  
783 SYRIA ORTAS 1, Tartus (pres.), 0125  
855 SPAIN RNE1 Synchros, 0109  
864 EGYPT ERTU, Santah (pres.) 0124  
945 FRANCE France Bleu, Toulouse, 0212  
1413 OMAN BBC Relay, A'Seela, 1407  
1512 SAUDI ARABIA BSKSA Jeddah, 0045  
1521 SAUDI ARABIA BSKSA, Duba, 0055  
1575 U.A.E. Radio Farda, Al-Dhabbiya, 0130

## EAST AND SOUTH ASIA

### CHINA

549 CHINA CNR5 Fujian (pres.), 1347  
666 CHINA V. of Straits (pres.), 1120  
684 CHINA CNR6, Putian, FJ, 1352  
765 CHINA CNR5, Fujian, 1306  
783 CHINA V. of the Strait, Fujian (pres.), 1202  
873 CHINA V. of Straits, Fuzhou (pres.), 1125  
909 CHINA CNR6, Quanzhou, 1313

927 CHINA CNR6, Fujian, 1313  
936 CHINA UNID CC probably Anhui, 1325  
963 CHINA CRI Russian Service, 1135  
981 CHINA CNR1, Synchros, 1350  
990 CHINA CNR (N) Shanghai (pres.), 1328  
999 CHINA UNID CC, Mar 24, 1335  
1035 CHINA CNR1 Synchros, 1330.  
1044 CHINA CNR FS. Korean, Yanji, 1327  
1044 CHINA CNR JJ Service, Changzhou, 1334  
1062 CHINA Zuijiang JGD, Guangzhou, 1334  
1071 CHINA UNID CC, probably Tianjin, 1336  
1089 CHINA CNR6 Fujian, 1318  
1116 CHINA CNR5, Shaowu, 1314.  
1125 CHINA Hebei E., Shijiazhuang, 1337  
1134 CHINA UNID CC probably CNR1, 1215  
1170 CHINA UNID CCs, two mixing, 1342  
1179 CHINA UNID CCs, two mixing, 1345  
1206 CHINA CNR Korean Service, 1232  
1278 CHINA UNID CC probably Heibei, 1240  
1305 CHINA UNID CC, 1245  
1323 CHINA UNID CC, 1247  
1332 CHINA UNID CC prob. Fuzhou, 1250  
1377 CHINA CNR1, Zengzhou, 1333.  
1377 CHINA UNID prob. V of the Strait' 1320  
1386 CHINA UNID prob. CNR1, 1350  
1395 CHINA UNID prob. Anhui 'Life', 1358.  
1404 CHINA UNID prob. Fujian EBS, 1335  
1422 CHINA UNID prob. Shanghai JGD, 1304  
1485 CHINA UNID CC, 1250  
1593 CHINA CNR1. Changzhou, 1228  
1593 CHINA CRI JJ Svc., Heilongjiang, 1345  
1602 CHINA UNID CC, 1346

### JAPAN

594 JAPAN JOAK, Tokyo, 1017  
693 JAPAN JOAB, Tokyo, 1058  
747 JAPAN JOIB, Sapporo, 0816  
774 JAPAN JOUB, Akita, 0816  
828 JAPAN JOBB, Osaka, 1207

873 JAPAN JOGB, Kumamoto, 1210  
891 JAPAN JOHK, Sendai, 1212  
954 JAPAN JOKR, Tokyo, 1218  
1017 JAPAN JOLB, Fukuoka, 1220  
1134 JAPAN JOQR, Tokyo, 1228  
1242 JAPAN JOLF, Tokyo, 1235  
1260 JAPAN JOIR, Sendai, 1347  
1287 JAPAN JOHR, Sapporo, 1242  
1314 JAPAN JOUF, Osaka, 1340  
1413 JAPAN JOIF, Fukuoka, 1401  
1422 JAPAN JORF, Yokohama, 0919  
1440 JAPAN JOWF, Sapporo, 1357  
1602 JAPAN NHK2 Synchros, 1257

### OTHER EAST & SOUTH ASIANS

657 N. KOREA Pyongyang BS, Kangnam, 1403  
972 S. KOREA HLCA, Dangjin, 1115  
1170 S. KOREA HLSR RK JJ Svc., Gimji, 1231  
1143 TAIWAN probably BEL3, Taiwan, 1341  
1170 PHILIPPINES VOA Relay, Poro, 1335  
1458 PHILIPPINES DWRF, FEBC, Iba, 1541  
1494 PHILIPPINES DYAB, Cebu City, 1340  
1566 S. KOREA HLAZ, Cheju Island, 1340  
1566 INDIA AIR Nagpur, 1411  
1575 THAILAND VOA Thailand, 1142

## PACIFIC

### AUSTRALIA

531 AUSTRALIA 4KZ, Innisfail, 1146  
540 AUSTRALIA 4QL Longreach, 1140  
549 AUSTRALIA 2CR, Orange, 1235  
576 AUSTRALIA 2RN, Sydney, 0847  
585 AUSTRALIA 7RN, Hobart, 1107  
594 AUSTRALIA 3WV, Horsham, 1245  
612 AUSTRALIA 4QR, Brisbane, 0804  
630 AUSTRALIA 4QN, Townsville, 1112  
648 AUSTRALIA 2NU, Tamworth, 1054  
657 AUSTRALIA 2BY Byrock, 0810  
684 AUSTRALIA 2KP, Kempsey, 1057  
702 AUSTRALIA 2BL, Sydney, 0907  
729 AUSTRALIA 5RN, Adelaide, 1254  
738 AUSTRALIA 2NR Grafton, 1058  
747 AUSTRALIA 4QS, Toowoomba, 1059  
774 AUSTRALIA 3LO, Melbourne, 1050  
792 AUSTRALIA 4RN Brisbane, 1053  
828 AUSTRALIA 3GI, Sale, 1102  
837 AUSTRALIA 4RK, Rockhampton, 0830  
846 AUSTRALIA 2RN Canberra, 1104  
864 AUSTRALIA 4GR, Toowoomba, 1057  
873 AUSTRALIA 2GB, Sydney, 1306  
891 AUSTRALIA 4TAB, Townsville, 1202  
927 AUSTRALIA 4CC, Gladstone, 0830  
1116 AUSTRALIA 4BC, Brisbane, 1120  
1224 AUSTRALIA 2RPH, Sydney, 1440  
1233 AUSTRALIA 2NC, Newcastle, 1212  
1287 AUSTRALIA 2TM, Tamworth, 1125  
1431 AUSTRALIA 2RN Wollongong, 1230  
1512 AUSTRALIA 2RN Newcastle, 1405  
1548 AUSTRALIA 4QD, Emerald, 0758  
1566 AUSTRALIA 3NE Wangaratta, 1410

### NEW ZEALAND

531 N.Z. More FM, Alexandra, 1340  
567 N.Z. National Radio, Wellington, 0753  
594 N.Z. R.Rhema Synchros, 0850  
612 N.Z. R.Rhema, Christchurch, 1022  
621 N.Z. R.Rhema Synchros, 1349



648 N.Z. R.Rhema, Gisbourne, 0855  
 657 N.Z. Southern Star, Wellington, 1030  
 675 N.Z. National Radio, Christchurch, 1035  
 693 N.Z. Radio Sport, Dunedin, 1038  
 711 N.Z. Trackside/R.Pacific, Wellington, 1325  
 720 N.Z. National Radio, Invercargill, 1325  
 738 N.Z. Radio Live, Christchurch, 1330  
 783 N.Z. Samoan Cap. R., Wellington, 0720  
 792 N.Z. Radio Sport, Hamilton, 1053  
 810 N.Z. National Radio, Dunedin, 1340  
 819 N.Z. National Radio, Tauranga, 1340  
 837 N.Z. National Radio Synchros, 0822  
 864 N.Z. NewsTalk ZB, Invercargill, 1057  
 882 N.Z. Southern Star, Auckland, 1348  
 900 N.Z. 4YC, Southern Star, Dunedin, 1307  
 918 N.Z. National Radio Synchros, 0820  
 945 N.Z. NewsTalk ZB, Gisbourne, 0721  
 972 N.Z. R. Rhema, Wellington (pres.), 1106  
 1026 N.Z. NewsTalk ZB Synchros, 1222  
 1035 N.Z. NewsTalk ZB, Wellington, 0735  
 1044 N.Z. NewsTalk ZB, Dunedin, 0738  
 1080 N.Z. NewsTalk ZB, Auckland, 1331  
 1125 N.Z. Radio Sport, Napier-Hastings, 0740  
 1152 N.Z. NewsTalk ZB, Timaru, 0742  
 1215 N.Z. NewsTalk ZB, Kaihoke, 1120  
 1278 N.Z. NewsTalk ZB, Napier-Hastings, 0740  
 1296 N.Z. NewsTalk ZB, Hamilton, 0750  
 1314 N.Z. National Radio, Gisbourne, 0753  
 1386 N.Z. R.Tarana, Auckland (pres.), 1135  
 1485 N.Z. R.Trackside, Gisbourne (pres.), 1136  
 1494 N.Z. Southern Star, Hamilton, 0755

#### OTHER PACIFIC STATIONS

558 FIJI Radio Fiji 1, Suva, 0757  
 720 HAWAII KUAI, Ele'ele, 1156

738 TAHITI RFO/R. Tahiti, Mahina, 0715  
 1017 TONGA A3Z, R. Tonga (t), 0731

## NORTH AMERICA

### USA

570 USA WTNB, Pinellas Park, FL, 0200  
 570 USA KLAC, Los Angeles, CA, 0240  
 640 USA KFI, Los Angeles, 1157  
 660 USA WFAN, New York, NY, 0248.  
 670 USA WSCR, Chicago, 0140  
 680 USA WPTF, Raleigh, NC, 1429.  
 700 USA KALL, N. Salt Lake City, UT, 1205  
 720 USA WGN, Chicago, 0445  
 740 USA KTRH, Houston, TX, 0230  
 740 USA KCBS, San Francisco, CA, 0925  
 770 USA KKOB, Albuquerque, NM, 1020  
 780 USA WBBM, Chicago, IL, 1054  
 810 USA KGO, San Francisco, CA, 0930.  
 830 USA WCCO, Minneapolis, MN, 0252  
 850 USA KOA, Denver, CO, 0256  
 880 USA KRVN, Lexington, NE, 0259.  
 1000 USA KOMO, Seattle, WA, 0911  
 1020 USA KCKN, Roswell, NM, 1205  
 1040 USA WHO, Des Moines, IA, 0320  
 1070 USA KNX, Los Angeles, CA, 0916.  
 1100 USA WTAM, Cleveland, OH, 0150  
 1110 USA WBT, Charlotte, NC, 0202.  
 1140 USA KHTK, Sacramento, CA, 0535  
 1120 USA KMOX, St. Louis, MO, 0327  
 1130 USA WBBR, New York, 0205  
 1160 USA KSL, Salt Lake City, UT, 0328  
 1180 USA Radio Marti, Marathon, FL, 0331  
 1200 USA WOAI, San Antonio, TX, 0458  
 1520 USA KVTM, Oxnard, CA, 0856  
 1530 USA KFBK, Sacramento, CA, 0700  
 1540 USA KMPC, Los Angeles, CA, 0705  
 1560 USA KNZR, Bakersfield, CA, 0900  
 1590 USA KKZZ, Santa Barbara, CA, 0905  
 1650 USA WCNZ, Cedar Falls, IA, 0210  
 1700 USA KVNS, Brownsville, TX, 0450

### CENTRAL AMERICA

530 T&CAICOS R.V.C. Intl., S. Caicos, 0057  
 555 ST. KITTS ZIZ, St. Kitts (pres.), 0130  
 570 CUBA R. Reloj, Santa Clara, 0200  
 690 MEXICO XE???, Tijuana, 0232  
 800 NETH. ANTIL. TWR, Bonaire, 0240  
 895 NEVIS V. of Nevis, Nevis (pres.), 0130  
 1090 MEXICO XEPRS, Rosarito, 0430  
 1220 MEXICO XEB, Mexico City, 0626  
 1410 MEXICO XECF, Los Moches, 0850  
 1570 MEXICO XERF, Villa Acuna, 0445  
 1620 VIRGIN ISL. WDHP, St. Croix, 0205

## SOUTH AMERICA

### ARGENTINA

590 ARGENT. R. Continental, Cap.Fed., 0308  
 594 ARGENT. R. Continental, Cap.Fed., 0800  
 700 ARGENT. R. Cordoba, Cordoba, 0156  
 870 ARGENT. R. Nacional, Cap.Fed., 0610  
 1610 ARGENT. R. Guaviyu, (B.A.), 0400  
 1650.1 ARGENT. R. Renacer, Q.Oeste, 0125  
 1660 ARGENT. Hosana AM, Ezeiza, 0130  
 1663.1 ARGENT. R.Bethel, Banfield, 0153  
 1667.76 ARGENT. R. Bethel, Banfield, 0138

### BRAZIL

1280 BRAZIL R. Tupi, Rio de Janeiro, 0023

### CHILE

1380 CHILE R. Corporacion, Santiago, 0107  
 1569.9 CHILE, R.Familia, Talca, 0230 -

### ECUADOR

540 ECUADOR R. Tropicana, Guayaquil, 0100  
 850 ECUADOR R.S.Francisco, Guayaquil, 0050  
 880 ECUADOR R. Catolica Nac., Quito, 0210  
 1120 ECUADOR Est.Inter'l, Guayaquil, 0028

### FALKLAND ISLANDS

530 FALKLAND ISL. FIRS, Port Stanley, 0250

### PERU

540 PERU R. Inca del Peru, Lima, 1417  
 580 PERU R. Maria, Lima, 1016  
 660 PERU R. Inolvidable, Lima, 0156  
 700 PERU R-700, La Grande, San Miguel, 0300  
 730 PERU R.Programas del Peru, Isidro, 0045 -  
 760 PERU Radio Mar Plus, Chorillos, 0230  
 820 PERU R. Libertad, Lima, 0241  
 880 PERU Radio Union, Lima, 0045  
 900 PERU R. Felicidad, Lima, 0325  
 960 PERU R. Pan Americana, Lima, 0102  
 990 PERU R.Latina/R.Victoria, Miraflores, 0300  
 1010 PERU R. Cielo, Lima, 0235  
 1400 PERU R. Callao Super, Lima (t), 0035  
 1470 PERU CPN Radio, Lima (pres.), 0040  
 1499.9 PERU R. Santa Rosa, Lima, 0122



*Ahu Akivi and its seven giant moai statues is the only fully restored archeological site on the interior of the island. From a high inland valley, the ancestor-figure moai kept watch on the village of their descendants and from some distance away on the Te Peu DX site.*



# A Shortwave Roundup

## Exploring the Programming on HF

By Eric Bryan

If you're like me, you're fascinated with certain countries or regions of the world and may have little interest in other areas. Obviously, these tastes are going to influence your shortwave listening. My areas of interest include Britain and Ireland, continental Europe and the Mediterranean, the Middle East, the Sahara/North Africa, Sub-Saharan Africa, and India.

You might tend to avoid transmissions from stations outside your areas of interest. But this would be a mistake. Though some shortwave broadcasters favor programming about domestic issues and that which generates tourism to their respective countries, many stations feature topics which range the globe. And even those who stick to domestic features still have international coverage in their news.

If you want African news, for example, the African services of Deutsche Welle, Voice of America, and the BBC (all often heard in the US) will give you considerable coverage and variety. And some broadcasters, such as Radio France International, have a truly global sweep to their coverage and topics.

While doing some concerted shortwave

listening on my Degen DE1103, I followed along with a pencil and paper and made notes on the topics covered by various shortwave broadcasters in their English programming. (I did not count the stations' domestic coverage. Also, sometimes a broadcaster's international news is limited to that of other countries only in relation to the broadcaster's home country. But it can still be worth your time and often this is news you won't hear anywhere else).

Here is what I found, in the order in which I found it over a period of many months.

### Shortwave Roundup

#### Radio Netherlands:

At 0100 UTC, 9845 kHz, *EuroQuest*: women in Islam in Turkey, protests in Ireland over proposed motorway which would cut through an ancient Celtic pagan site called Tara Hill, exorcisms in Romania, and nature therapy (gardening in a London allotment) for Iraqi torture victims. At 1900 on 17660, *Vox Humana*: western Australian monastery; *Wide Angle*: New Zealand race relations between Maoris and whites. At 1930 on 11655, news

on Ethiopia, Zanzibar, Congo, Israel, Iran, France, Turkey, Libya, Egypt, Chad, and Pakistan; *NewsLine*: Parisian riots.

#### BBC:

At 0300 on 5975, *Outlook*: endangered turtles in Cambodia, and world music, focusing on traditional music of Armenia. At 0430 on 7120, *Network Africa*: hijacking of ships off the Somali coast by modern pirates; *Assignment*: irrigation of the Egyptian desert via piping of the Nile. At 2030 on 12095, news on Syria, the US, India, Iraq, Cuba/Guantanamo Bay, and Germany; *Newshour*: UN Security Council investigation into possible Syrian connection to death of Lebanese PM, Rosa Parks remembrance, Parisian riots, avian flu, and Venezuelan president's railing against Halloween as "a gringo holiday."

#### Radio Prague Int'l, Czech Republic:

At 0330 on 6040, *Magazine*: Egyptology; *One on One*: interview with doctor who worked under Saddam Hussein. At 0400 on 6100, news on Iraq, Hungary, Luxembourg, the EU, and Mexico. At 0300 on 9870, news on the US, Israel, the UK, and Germany; *Current Affairs*: Wi-Fi connection access in Ukraine and Germany and elsewhere in Europe, the proposed independence of Montenegro from Serbia and joining the EU, the future EU membership of Croatia and Turkey, Holocaust denial and education, and possible EU membership of Iceland, Norway, and Switzerland in 2007; *One on One*: interview with post-traumatic stress disorder expert who treated people returning from Iraq and those who experienced terror attacks in Egypt, and who after the 9-11 attacks wrote a how-to book on dealing with the shock and stress of horrible experiences. At 0400 on 6200, news on Ireland, the US, Russia, and the EU; *One on One*: interview with Irish author.

#### Radio Taiwan Int'l:

At 0200 on 5950, news on the UK, the US, Vietnam, and China; *On People*: interview with English lawyer who provides legal aid to the poor in the UK, especially those wrongly convicted and tortured/forced to "confess" by police; *Instant Noodles*: dumping boyfriends or girlfriends in Australia via text messages, a musical premiering in Australia about Imelda Marcos, the naming of a panda in a Washington DC zoo, a prison break in India following the earthquake in Pakistan-Kashmir-India (with escapee slipping from Uri into Kashmir),



*Tea or coffee go hand-in-hand with shortwave.*



and Chinese astronauts sent into space with gourmet Chinese cuisine – 50 dishes, including cuttlefish.

#### **Radio Japan:**

At 0000 on 6145, *44 Minutes*: African wildlife, and new Iraqi constitution and elections; *Asia Watch* (a part of *44 Minutes*): news on Vietnam, China, Iran, Bangladesh, Thailand, Indonesia, India, Sri Lanka, and Malaysia. At 0500 on 6110, *44 Minutes*: feature on Lesotho.

#### **Voice of Greece:**

At 1830 on 12105, news on Indonesia, the US, Britain, Iraq, Cuba, Pakistan, and China; economic info on Japan, China, Germany, Poland, Hungary, Malta, Estonia, Latvia, and France; news on The Rolling Stones and Prince Charles; *Cultural Feature*: Russian painters of the 20<sup>th</sup> century; *Special Feature*: the modernization of the European Union, and flap between Germany and UK.

#### **Voice of America:**

At 1800 on 15580, *Africa News Now*: news on Hungary, the Vatican, Australia, and Nigeria. At 2000 on 15445, *Nightline Africa* ("All aboard the Night Train!"): news on Nigeria, Liberia, Sierra Leone, Uganda, and Sudan. At 2000 on 15445, feature on Somalia. At 2100 on 15580, news on Syria, the US, Israel, India, and Pakistan. At 2030 on 15580, *Africa World Tonight*: feature on American people's interest in Arab and Muslim culture, and interview with Egyptian Christian who teaches on Arab and Muslim culture.

#### **Deutsche Welle:**

At 2100 on 11865, news on Nigeria, Pakistan, Poland, England, and Iraq; *Religion & Society*: the Christian minority in Turkey; *Inspired Minds*: interview with US author Dawn Clifton Tripp. At 2100 on 11865, news on India, Iraq, the US, Iran, Israel, and Syria.

#### **Radio Australia:**

At 1600 on 5995, *Australia Talks Back*: "Dream Wranglers": call-in program for/about those who follow a dream – included interview with US filmmaker. At 2000 on 11880, news on India, Syria, Jordan, Indonesia, and Papua New Guinea. At 1730 on 11880, interview with Turkish film director discussing his movie about Kemal Ataturk, Gallipoli, and World War One.

#### **CBC, Canada:**

At 2000 on 15325, *Spotlight*: the history of Halloween, including interview with English professor who wrote book on Halloween. At 2300 on 9625, news on Indonesia, France, the European space program, and Jordan. At 0000 on 9755, news on Jordan, Iraq, Israel, the US, and France.

#### **Radio Canada Int'l:**

At 1800 on 15365, news on Iraq, Afghanistan, and Israel. At 1800 on 15235, news on Russia, Iraq, Algeria, Morocco, Egypt, Greece, Israel, France, Nigeria, Somalia, Sudan, China, Senegal, Mauritania, Canary Islands, and the US; *The Link*: Canadian policy in Afghanistan on prisoners of war, plight of Algerian man sent from Canada to US immediately after 9/11 who spent five years in detention as terror suspect, and interview with Maria Naimas, author of *Prisoner of Iran*, about her years of torture and beatings in Iranian prison (said she couldn't escape her past, so turned around and faced it full-on and wrote the book about it).

#### **Radio France Int'l:**

At 1700 on 17605, news on Sudan, Rwanda,

Eritrea, Senegal, Kenya, Liberia, and the US. At 1700 on 15605, news on Tanzania, Zanzibar, Nigeria, India, Eritrea, Zimbabwe, Burundi, Congo, Brazzaville, Morocco, and Iraq. At 1600 on 15605, news on Ethiopia, Eritrea, Zanzibar, Iran, Iraq, the US, Sudan, Germany, and Congo; *Voices*: interview with US author Darcey Steinke. At 1700 on 11615, news on Israel, Iran, South Africa, Turkey, Bulgaria, Greece, China, Congo, Russia, Ukraine, Italy, Zimbabwe, Kenya, Nigeria, Egypt, Iraq, Bangladesh, Sudan, Saudi Arabia, the Philippines, and extended segment on Afghanistan. At 1600 on 15160, news on Kenya, Saudi Arabia, Sweden, Pakistan, Germany, Iraq, Afghanistan, Zimbabwe, and Nigeria; *Network Europe*: stories on Germany, Sweden, Belarus, CIA detention centers in Europe, Kosovo, Serbia, and Belgium. At 0400 on 11700, news on Sudan, Congo, Somalia, Liberia, Nigeria, Canary Islands, Iraq, Afghanistan, Sri Lanka, East Timor, and Spain.

#### **Channel Africa (South Africa):**

At 1700 on 15235, news on Zambia, Nigeria, Uganda, and Gabon; *Africa This Week*: news on Ivory Coast, Botswana, Tanzania, malaria, and Homeless World Cup 2006 (football/soccer). At 0630 on 7385, news on Kenya, Jordan, Saudi Arabia, Egypt, and the US. At 0300 on 7390, news on Zimbabwe, Senegal, Sudan, Guinea, Zambia, Gambia, Congo, Tanzania, Algeria, Somalia, and the US; economic news on wireless internet in Zimbabwe; recent history of war and revolution in Liberia; UN Radio special on deteriorating conditions in post-war Sierra Leone (e.g., water and electricity shortages). At 0500 on 7240, news on Somalia, Morocco, the US, and Nigeria. At 0500 on 9685, news on Nigeria, Mali, the US, France, China, the UK, Russia, Israel, Lebanon, Lesotho, and nuclear conference in Vienna; *Economic News*: embargo on Liberia, fuel distribution in Uganda (fuel via Kenya), and Venezuelan energy and oil projects; *Africa Rise & Shine*: situation in Somalia with detailed eyewitness report from Mogadishu, return of refugees to Sudan (a UN Radio report), US-German meeting on free trade and climate change, US-Iran relations, employment in Swaziland, and computer and electronic equipment recycling in India (a UN Radio report from Bangalore), and weather report for throughout the African continent.

#### **Radio Tanzania, Zanzibar:**

At 1800 on 11735, news on China, Russia, South Korea, Cameroon, Kenya, Rwanda, Egypt, Nigeria, Pakistan, Sri Lanka, Uganda, South Africa, Afghanistan, the Philippines, the US, Sudan, Venezuela, Israel, Romania, Saudi Arabia, India, Thailand, Haiti, Iran, Zambia, Latvia, and Jordan.

#### **Radio Jordan:**

At 1600 on 11690, news on Iraq (in detail), Sudan, Lebanon, Israel, Syria, Iran, the US, Pakistan, India, Ethiopia, Saudi Arabia, China, and Eritrea. At 1700 on 11690, news on the US, Israel, the UK, the UN, Russia, Iran, Egypt, Iraq, Saudi Arabia, Afghanistan, Kuwait, Yemen, Turkey, India, Pakistan, Denmark, and Morocco; *Newspaper Headlines* (in Jordan): stories on Israel, Egypt, France, Saudi Arabia, Pakistan, the US, Singapore, Russia, Iran, India, Afghanistan, South Africa, Ukraine, and Uzbekistan.

#### **KOL Israel:**

At 1830 on 11590, news on the US, Syria, Iran, Nigeria, Germany, and in-depth segments on Syria and Iraq. At 0600 on 7385, news on Jordan, Saudi Arabia, Egypt, Iran, the US, and the UK. At 2000 on 11590, news on Pakistan,

Iran, the UN, Russia, Lebanon, Denmark, Syria, Saudi Arabia, Serbia, and Kosovo.

#### **All India Radio:**

At 1830 on 9425, news on Jordan, UN oil-for-food scandal, Pakistan, Sri Lanka, Nepal, Afghanistan, Kashmir, Asia-Pacific Summit, Bangladesh, Russia, China, Saudi Arabia, Israel, Iran, France, Germany, and the UK. At 2045 on 11620, news on Iraq, the US, and the UK. At 2200 on 11620, news on Afghanistan (with much detail on the Taliban), Argentina, Pakistan, the US, and Iran; commentary on Iran's nuclear program.

#### **Radio Austria International:**

At 1605 on 13675, *Week in Review*: UN declares Holocaust memorial day, 50 year old Austrian planning to walk Antarctica to the South Pole without technical support, CIA secret detention centers in Romania and Poland, and interview with writer of book about plight of women in the Bosnian war. At 1650 on 13675, *Report From Austria*: Iran's nuclear program. At 0040 on 7325, news on Iran, France, Germany, and the UK. At 1615 on 13675, news on Iran, Israel, the Balkans, Romania, and Kosovo; *Report From Austria*: debate of the Quartet (the EU, the US, the UN, and Russia) whether or not new Palestinian Hamas government should receive foreign funding, and search for new president of Kosovo.

#### **Radio New Zealand:**

At 1700 on 9870, news on Tonga, Papua New Guinea, Vanuatu, Fiji, French Polynesia, and Marshall Islands; *Pacific Correspondent*: feature on Guam, with info on medicine, museums, and coral reefs. At 1900 on 11725, *World News*: news on Fiji, Indonesia, the UK, Iraq, and Pakistan; *Asia-Pacific News*: coverage of the Solomon Islands and Papua New Guinea.

#### **RAI Italy:**

At 0055 on 11800, news on the EU, France, Iraq, Germany, the UK, Venezuela, Afghanistan, Russia, Croatia, Algeria, Egypt, Syria, Denmark, Spain, Austria, France, Portugal, Czech Republic, Hungary, Mexico, Poland, Ukraine, Israel, the Balkans, and the US.

#### **Voice of Russia:**

At 0300 on 15595, news on Iraq, France, Germany, Iran, Syria, Lebanon, India, Pakistan, Mongolia, China, Israel, the US, Ukraine, Moldova, Georgia, and Afghanistan; *News and Views*: the EU, Iraq, the US, Chechnya, China, and Israel. At 0500 on 9840, news on Israel, Iran, and Japan. At 0200 on 13635, *News and Views*: analysis and commentary on US presence in Iraq, debate on Kosovo and Belgrade regarding the UN 1999 Resolution, the exhumation of remains of Soviet soldiers at a war memorial in Estonia, and criticism of both Turkey's WWI policy of genocide against its Armenian population and Turkey's current policies on Georgia and Kosovo.

#### **Vatican Radio:**

At 1730 on 11625, news on Ghana, Iraq, Liberia, Zambia, Belgium, Uganda, Nigeria, Israel, Iran, Sudan, South Africa, Lebanon, Cuba, Egypt, Somalia, Rwanda, Tanzania, Jordan, Congo, and Morocco. At 0500 on 7360, *African Panorama*: elections in Uganda; Belgian airline flights from Brussels to Rwanda.

#### **KBS World Radio, South Korea:**

At 0200 on 11810, news on Japan, China, Taiwan, Asia-Pacific Summit, North Korea, United Arab Emirates, the US, Iraq, and Iran; commentary on US presence in South Korea.



### China Radio International:

At 2300 on 11970, *News and Reports*: news on Indonesia, the US, Jordan, Iraq, Spain, North Korea, Israel, France, Germany, Afghanistan, and the EU.

### Radio Thailand:

At 0300 on 5890, news on Japan, the US, Jordan, the UK, Indonesia, and Switzerland; *Passage to Russia*: the 1892 visit by Grand Duke Nicholas II to Siam, celebrating the construction of the Trans-Siberian Railway (presented by Thai Airways, "Smooth as Silk").

### Radio Exterior de España, Spain:

At 0000 on 6055, news on Iraq (in-depth), Asia-Pacific Summit, Israel, France, Italy, Chile, Mexico, the US (in-depth), Venezuela, North Korea, Iran, the EU, Albania, Lebanon, the UK, the Vatican, Bolivia, Russia, Ukraine, Germany, Hungary, Norway, Afghanistan, South Korea, Portugal, and Ecuador; *American Chronicles*: program on Latin America, with coverage of Chile, Peru, Venezuela, Colombia, the West Indies, and Haiti; *Lab Notes & Field Notes*: health benefits of the Mediterranean diet, focusing on olive oil, skim milk, and other low-fat dairy products; *Press Review* (what's in Spanish newspapers): topics covered Serbia-Montenegro and Bolivia. At 2000 on 15290, news on Italy, Iraq, Israel, France, Mexico, Sierra Leone, Bolivia, and Chile. At 0000 on 15385, news on Israel, Iraq, Egypt, Algeria, Morocco, Senegal, Equatorial Guinea, Liberia, and Poland; *Lab Notes & Field Notes*: health benefits of moderate consumption of red wine and coffee. At 0000 on 6055, *Radio Waves*: feature about Radio Racja, which broadcasts from Poland into Belarus.

### Star Radio, Liberia:

At 2100 on 11960, news on Ukraine, China, Sudan, Chad, Israel, Egypt, Nigeria, Ghana, South Africa, Uganda, Congo, the US, and Iraq.

### Voice of Vietnam:

At 0100 on 6175, news on Israel, Egypt, Cambodia, China, Chechnya, Russia, Japan, Germany, Iran, Singapore, Philippines, Italy, Iraq, Turkey, and North Korea; commentary on CIA detention centers and alleged torture; special coverage of Israel and Ariel Sharon.

### Radio Cairo, Egypt:

At 0200 on 7270, *The Meaning of the Koran*: Koran singing translated into English; news on Sudan, Israel, Iraq (with extended segments), the US, Germany, Italy, France, Denmark, Lebanon, Syria, Iran, Russia, Congo, India, Tunisia, Pakistan, Afghanistan, the EU, Austria, the UK, Algeria, Sierra Leone, Liberia, Mauritania, Saudi Arabia, Somalia, Uganda, and North Korea.

### Radio Sweden:

At 0230 on 6010, *News & Reports*: news on Israel, Serbia-Montenegro, Germany, the UK, Denmark, Norway, Spain, Russia, Ukraine, Italy, Morocco, the US, France, and Austria; reports on France commemorating end of slavery (via RFI), health care in Romania (via Radio Netherlands), the Polish Welfare Association in Northern Ireland (via Radio Polonia), and Iran's nuclear program. At 0330 on 6010, *News & Reports*: news on Denmark, Tunisia, Indonesia, Sudan, and Germany; features on malaria, furor over Islam-related cartoons in Scandinavian newspapers, and prisons in Iraq.

### Radio Bulgaria:

At 0000 on 9700, news on Romania, Iraq, Af-

ghanistan, Bosnia-Herzegovina, Libya, Turkey, the Balkans, Croatia, Czech Republic, Estonia, Nigeria, Poland, the US, Austria, Albania, the EU, Israel, Kosovo, Germany, Iran, Kazakhstan, and Russia; *Events & Developments*: stories on Albania, Slovenia, Greece, Turkey, Italy, and Serbia.

### Radio Vilnius, Lithuania:

At 2330 on 7325, news on Russia, the US, Estonia, Slovenia, the EU, and Austria. At 0030 on 11690, news on South Korea-Lithuania bilateral relations; recall of Lithuanian ambassadors from Denmark, Iceland, Croatia, Slovenia, Sweden, Estonia, Latvia, etc.; news on Belarus, the EU, Cyprus, Malta, Serbia, Romania, Bulgaria, the UK, Poland, Moldova, Ukraine, Slovakia, Iraq, Germany, Russia, and the US (coverage of the Cheney-Putin flap over Cheney's statement in Lithuania); program on Lithuanian community in Sweden.

### Radio Slovakia International:

At 0100 on 7230, *Slovakia Today*: news on Kosovo, Russia, Hungary, the EU, Denmark, Italy, Israel, Spain, Germany, Austria, France, Sweden, Poland, Czech Republic, Serbia-Montenegro, the UK, the US, Croatia, and Albania; *Insight Central Europe*: features on politics/elections in Poland, Czech Republic, Slovenia, Hungary, and Belarus, including reports from Radio Polonia, Radio Prague Int'l, Radio Slovenia, and Radio Budapest.

### Croatian Radio, Croatia:

At 0300 on 7285, *Croatia Today*: news on

Serbia-Montenegro, the EU, Austria, former Yugoslavia, Russia, Ukraine, Vatican, Switzerland, Greece, Germany, the US, the UK, Bosnia-Herzegovina, Macedonia, Albania, Slovakia, Belgium, Italy, Hungary, Ireland, Poland, the Balkans, Slovenia, India, Kosovo, Nigeria, Pakistan, Iran, Lithuania, and Denmark.

### Banns Radio International, Denmark:

At 0630 on 7385, (Sundays) *Copenhagen Calling*: news on Saudi Arabia, Libya, Iran, Sweden, Norway, Finland, the EU, the US, and Bulgaria; piece on discovery of a planet by Danish astronomers working from Chilean observatory.

### Voice of Nigeria:

At 1700 on 15120, *Sixty Minutes*: news on Kenya, Egypt, Sudan, Indonesia, Japan, Iraq, Zimbabwe, the US, Uganda, Somalia, Burundi, Congo, Israel, and India. At 2000 on 15120, *Sixty Minutes*: news on Congo, Ethiopia, Pakistan, Afghanistan, the US, Iraq, Somalia, Kenya, and Uganda; feature on tuberculosis in Africa.

### Adventist World Radio, via KSDA Guam:

At 1600 on 12065, *Wavescan*: history, culture, and religions of Myanmar/Burma; DX report.

### Radio Romania Int'l:

At 0400 on 6115, *Radio Newsreel*: news on Israel, Indonesia, Kosovo, Iraq, Lebanon, Iran, Portugal, and Bulgaria. At 0400 on 11820, *Radio Newsreel*: news on the EU, China, Japan, Israel, and Italy. At 0400 on 9780, *Radio News-*



Tools of the trade



reel: news on Iran, Italy, Bulgaria, Poland, Finland, Gt. Britain, Ireland, Israel, Afghanistan, Slovakia, Iraq, and the EU; program about the Black Sea states with coverage of Azerbaijan and Russia.

#### **Radio Budapest, Hungary:**

At 0200 on 9515, news on Italy, Slovakia, Turkey, Venezuela, Israel, and Slovenia; *Hungary Today*: interview with British travel-writer; medical report on stimulating antibody production to fight high cholesterol. At 0100 on 9590, news on Pakistan, Israel, Croatia, Austria, Sweden, Portugal, Finland, Czech Republic, Germany, France, Slovakia, and Slovenia; *Spotlight*: relations between Britain and Hungary; *The Week*: coverage of Turkey and Sweden, and segment on Irish culture; *DX Corner*: 75<sup>th</sup> anniversary and history of HCJB, Quito, Ecuador; *Insight Central Europe*: healthcare in Slovakia, the East European Television Awards held in Slovenia, Labor Day in the Czech Republic, and the closing of a landmark nightclub in Poland. At 0200 on 5980, news on Russia, Czech Republic, Poland, the US, Slovenia, Slovakia, Ukraine, Romania, Bulgaria, Germany, Kosovo, Serbia, Croatia, Turkey, and Afghanistan; *Insight Central Europe*: the opening of former Czechoslovakian police state records, Slovenia's considerable military etc. contribution to occupation of Iraq, and coverage of Poland.

#### **Radio Ukraine Int'l:**

At 0300 on 7440, news on Russia, Israel, the EU, Austria, Poland, Romania, Sri Lanka, Iraq, Iran, and Syria; *The Whole World on the Radio Dial*: pros and cons of transmitting in Digital Radio Mondiale vs. AM modes, and former RCI's Ian McFarland's SW interval signal CDs. At 0100 on 7440, *News & Reports*: news on the EU, Italy, Belarus, the US, Czech Republic, Russia, Croatia, Poland, Malaysia, Slovenia, France, Canada, Belgium, and Morocco; *Music From Ukraine*: included references to music from South Korea, Finland, Portugal, and Russia; *Ukraine Today*: with coverage of the EU and Germany; *Ukrainian Diary*: with references to Germany, the EU, Portugal, Turkey, Argentina, Canada, the US, Uzbekistan, Russia, Bulgaria, and Romania, and Russian, North Korean, and Iranian flap over proposed US missile defense system sites in Poland and the Czech Republic.

#### **Radio Havana Cuba:**

At 0600 on 6000, *International News*: news on Guatemala, Pakistan, the US, Chile, Afghanistan, Haiti, and Iraq. At 0500 on 6000, *Economic Report*: Venezuela's economy and trade.

#### **RAE, Argentina:**

At 0200 on 11710, news on Holland, Chile, the EU, Paraguay, Uruguay, Cuba, Brazil, Italy, Belarus, Russia, the US, Iraq, and Bolivia.

#### **Radio Tirana, Albania:**

At 0330 on 7465, news on the US, the UK, Pakistan, Israel, Germany, Italy, Lithuania, Poland, Bulgaria, Greece, Ukraine, Slovenia, Macedonia, Georgia, Romania, Serbia, Kosovo, Russia, and Serbia-Montenegro; program on Albania's entry into the EU included material on Macedonia, Croatia, and Ukraine.

#### **Voice of Turkey:**

At 0300 on 6140, news on the EU, Cyprus, Iraq, and the US; *Review of the Turkish Press*: coverage of the EU. At 0400 on 6020, news on Iran, Saudi Arabia, Afghanistan, France, the US, Israel, Iraq, Pakistan, Persian Gulf, Gulf of Oman, Cyprus, the EU, Italy, the UK, Germany, Austria, Sweden, Denmark, Belgium, Arme-

nia, Jordan, Egypt, Armenia, Russia, South Africa, Indonesia, Congo, and India; *From the World*: smoking bans in Luxembourg, Russia, Sweden, and Belgium; *Review of the Turkish Press*: included coverage of Egypt, Pakistan, and Georgia, and detailed coverage of Iraq; *Eurasia*: Russian flap over proposed construction of US "Star Wars" missile defence sites in the Czech Republic and Poland; *Agenda*: commentary with references to Bulgaria, Pakistan, and Russia.

#### **Voice of Justice, Iran:**

At 0130 on 9495, news on Iraq, the US, Afghanistan, Israel, Turkey, Japan, Guam, India, Russia, Peru, Venezuela, Bolivia, Colombia, Ecuador, and North Korea; commentaries on situations in Iraq and Afghanistan, including interview with US official; coverage of Egypt, Syria, Sudan, and Saudi Arabia; *Occupation Crisis*: Kurdish New Year (March 21); Iraqi expectations of new government; energy crisis and Shell Oil flap in Nigeria.

#### **RTE Ireland:**

At 1300 on World Radio Network via KXOT 91.7 FM, news on Israel, Iraq, the US, Spain, and Australia; commentary on the Israeli-Palestinian situation and the occupation of Iraq.

### **Retreat to the Web**

The following stations, due to frequencies used and/or broadcast schedules or propagation conditions, I finally despaired of hearing, and so I resorted to their websites. (Most of them I used to hear easily and regularly on shortwave.) The websites are listed below. Simply follow the English links (sometimes you have to hunt for them) where appropriate on the home pages. Some broadcasters provide material in text only; others have live streaming and/or audio on-demand or MP3 downloads available. Still others have some combination of text and streaming or audio on-demand or downloading.

#### **Radio Polonia, Poland:**

Audio on-demand at [www.radio.com.pl/polonia/](http://www.radio.com.pl/polonia/) *News From Poland*: included references to France, Holland, the EU, Northern Ireland, Russia, Germany, Ukraine, the UK, and Belarus; *Eurofile*: coverage included Latvia, Slovakia, Lithuania, and Estonia; *Europe East*: coverage of the Baltics, Ukraine, Belarus, former Yugoslav republics, Czech Republic, Hungary, Slovakia, Bulgaria, Romania, and Moldova.

#### **Radio Belarus:**

Audio on-demand at [www.tvr.by/eng/radiobel.asp](http://www.tvr.by/eng/radiobel.asp) *News* with references to Armenia, Georgia, Kazakhstan, Moldova, Russia, Ukraine, Turkmenistan, the US, France, Bulgaria, Hungary, Sweden, and China.

#### **The International Radio Serbia & Montenegro:**

Programs in text at [www.radioyu.org/index.php?language=English](http://www.radioyu.org/index.php?language=English) *News*: China, the US, Russia, the EU, Czech Republic, and Austria; *Politics*: the Russian foreign policy in the Balkans; *Economy*: the freezing by Condoleezza Rice of US aid to Serbia.

#### **Radio Damascus, Syria:**

You can get access to material from both the domestic and international services through the website at [www.rtv.gov.sy/](http://www.rtv.gov.sy/) There are English links, but at the time of writing, the English portions of the website are under construction.

#### **The Voice of Africa, Libya:**

Material in text at [www.ljbc.net](http://www.ljbc.net) *News*: coverage with references to Tunisia, Burkina Faso, Algeria, Qatar, Portugal, the US, Egypt, Oman, Yemen, the UK, Niger, Italy, the UAE, Sudan, Nigeria, Mali, Sierra Leone, Jordan, Syria, Iraq, the Arabian Peninsula, Senegal, Ivory Coast, the Sahara (referring to the tribes that dwell throughout the desert), Canada, Chad, Russia, Lebanon, Belgium, Cameroon, Central African Republic, Congo, Equatorial Guinea, Gabon, and Ghana.

#### **Radio Singapore Int'l:**

Material in text at [www.rsi.sg](http://www.rsi.sg) *Newsline*: coverage of East Timor, Japan, Taiwan, China, Malaysia, Bangladesh, Indonesia (Java, Sumatra, etc.), the US, North Korea, Thailand, Russia, and Iraq. Also live streaming.

### **Keep Listening: It's Out There**

You can see what you've been missing by not tuning around. Here's a recap of some of the plum highlights from the list:

If your passions are Egyptology or Irish writers, you might not have thought to tune into Radio Prague, but if you didn't, you lost out. Or African wildlife and Lesotho? That was Radio Japan. For early 20<sup>th</sup> Century Russian painters, it was The Voice of Greece.

American authors were interviewed on Deutsche Welle and RFI, and US and Turkish filmmakers were featured on Radio Australia.

If you have no interest in shortwave broadcasts from Canada, you missed the history of Halloween on CBC and the Iranian author on RCI. And I found much more about Iran on Radio Austria Int'l.

You could have learned about Guam via RNZI. And if wireless internet in Zimbabwe and computer recycling in India strike your fancy, you should have been listening to Channel Africa (South Africa). More African coverage was had from Vatican Radio's African services.

Are you interested in Latin America and healthful diet tips? I hope you were listening to REE Spain. The Voice of Vietnam carried analyses on the Israeli-Palestinian and Ariel Sharon situations. More analysis of Israel, plus detailed reports on Iraq, I got from RTE Ireland.

If you want to learn about malaria and Iraq prisons, Radio Sweden might not be the first broadcaster that leaps to mind. If not, check the list to see what's passed you by. And who would ever have expected AWR to have a feature on the history and culture of Myanmar/Burma?

Radio Budapest? They interviewed a British author, and had segments on Irish culture and the history of HCJB. More programming about shortwave I heard on Radio Ukraine Int'l with their debate about DRM vs. AM modes of broadcast.

And though there's not much news on Luxembourg these days, The Voice of Turkey looked into smoking bans in Luxembourg, Russia, Sweden, and Belgium.

Compiling this list was a lesson to me to be more open-minded and stop skipping over stations due to a lack of interest in their geography or culture.

Please consult the "Shortwave Guide" in this issue and other schedules for current broadcast times and frequencies.



# The Kids Are Alright The ARRL's "Big Project"

By Ken Reitz KS4ZR

**A**s America's ham radio population ages, the number of hams dwindles. Over the last 15 years, new schemes to expand this population by making it easier to obtain a license have not stemmed the out-rushing tide. And, if the future of amateur radio lies in the next generation, some hams are in despair. The common belief is that today's kids, pre-occupied with iPods, cell phones, and access to the Internet are not attracted to amateur radio. It's a lucky thing for the future of this hobby that many are not buying that belief.

## The League Steps In

This past February marked the 22nd School Club Roundup (SCR), an on-air contest for schools (elementary, middle, high school, college and post-graduate) to activate their school club stations, promote awareness of amateur radio in schools, and introduce the students to world-wide HF amateur radio activities. The SCR is so popular that a second fall contest was added last October. This year's SCR was expected to be the best yet.

The school clubs involved have spent months and, for some, years of hard work on the part of dedicated class room teachers, parents, and administrators who are introducing America's students to amateur radio. The good news is that they don't have to do it alone. The American Radio Relay League (ARRL), the nation's foremost organization of radio amateurs, helps America's educators through its Amateur Radio Education & Technology Program (ETP) which is also known as "The Big Project."

The Big Project is a substantial program which not only provides interested teachers with information and support, but offers hands-on training and funding grants for qualifying schools. The ARRL says the goal of the Big Project, which is open to public and private schools, is "...to improve the quality of education by providing an educationally sound curriculum focused on wireless communications. The project emphasizes integration of technology, math, science, geography, writing, speaking, and social responsibility within a global society."

Part of the Big Project is to offer a "Teachers Institute on Wireless Technology," a sort of "summer camp" for teachers who want to become a Big Project school. The seminars are offered during the summer in Rocklin, CA; Spokane, WA; and at League HQ in Newington, CT. After four days of seminars, the teachers return to their hometowns with the know-how to incorporate amateur radio, robotics, space technology, satellites, and weather into their curriculum. They also come away with a *Radio Lab Handbook* and curriculum guide, instructional electronics kits, a magnetism kit, a Parallax Basic Robotics kit, a Parallax "What is a Micro Controller" kit, a Parallax Optascope, resource supplies, and reference library. Some,

who have applied for station grants, even come away with a complete amateur radio station.

The best part about this program is that it's free. And, because it's free, enrollment in each session is limited to 12 participants. All applicants are screened thoroughly and given final approval by the ARRL Board of Directors. The League is looking for teachers or other participants who will make a long term commitment to being a Big Project school.

Mary Hobart, K1MMH, Chief Development Officer for the ARRL, says that funding for the Big Project is done through separate contributions to the League by a few donors. She says that the annual Big Project budget is around \$150-200,000. According to Mark Spencer, WA8SME, director of the Teachers Institute on Wireless Technology, The Big Project has been operating for four years and currently has 222 Big Project schools up and running nationwide, introducing thousands of students to wireless technology each year. Spencer says that the mix of schools is about 50-50 public/private. Smaller public schools with a centrally located administration can help private schools move this type of project more quickly and cut through red tape encountered in the private sector.

While many have taken the League up on its Big Project offer of training and equipment, other teachers have started programs on their own. Many are already hams and enlist the cooperation of local ham radio clubs in their effort. Some also enlist the help of local ham radio related manufacturers. Whatever it takes.

## These Schools Are Radio Active

So, how's it working out? Teachers, students and even administrators are enthusiastic about this program. There is a real sense of accomplishment with all involved. Here's a sample of the comments from club stations I contacted after the Feb. 2007 SCR:

### Beaver Lake Middle School KC7LHG (Issaquah, WA)

Robert Gregory, KD7H, a life long ham, was an advisor to his previous school club for over 15 years and now into his second year at Beaver Lake Middle School. He decided it was once again time to get radio-active. In his first school at least 15 students got their tickets and many are still active. At Beaver Lake he has already had two students receive Technician licenses (and studying for the General Class). He reports that another five are currently studying for their Tech license.

He writes, "Amateur radio has been a way of life for me for 45 years and, as a teacher, it's natural for me to enthusiastically share my beloved hobby with my students. In the beginning, I used my own equipment....there's never enough money in school budgets for...things like amateur radio transceivers,



*QSL from K5LBJ, the club station for LBJ High School, Austin, TX founded in 2004. At LBJ High Amateur Radio is an elective class where teacher Ronny Risinger is the sponsor. Last year they copped top honors in the High School division in the School Club Roundup. (Courtesy: LBJ High School)*



*School Club Station AD8B, Zion Lutheran School in Harvester, MO in Dave Von Dielingen's 6th grade class. (Courtesy: Dave Von Dielingen)*



*Ronny Risinger KC5EES, school club sponsor at K5LBJ accepts a grant in 2005 from Best Buy General Manager Steve Smith. Club President Noah Kalish, club VP Tamara Sevier, and club Elmer Joe Fisher look on. The club was able to buy computer equipment for their shack. (Courtesy: Ronny Risinger)*

coax and antennas and one must volunteer after school time and gear, otherwise a (school) club would never happen." He reports that his Principal, Josh Almy, "...is very supportive of my radio club effort with the kids, [even] supporting the inclusion of School Club Roundup activities into the week's lessons. Also, club members' parents have been enthusiastic supporters."

### Kermit King Elementary School N6KKS (Arcadia, CA)

Mary Mason, W6ROX, a teacher at Kermit King Elementary School said, "We had a club at



the High School and I am a ham so I contacted the High School teacher and we arranged to have 2 meter simplex contacts with the High School the first year. We then planned to participate in the SCR in 2005. Tim Schiller, N6BT (of Force 12 Antennas), provided the antenna, a 20 meter dipole on a mast that we set up on the lawn. We won the elementary SCR division that year. We have continued to participate in SCR since that time. We do not have a station set up at the school year 'round but set up for the contests....

"There are issues of space, mounting the antennas on buildings and all the academic testing pressures to deal with. (Ham radio is not on the state assessments!)" She adds that she has received growing support from staff, parents and administrators.

#### **Zion Lutheran School AD8B (Harvester, MO)**

Dave Von Dielingen, AD8B, a ham since 1964, started his club in 1993 for 6<sup>th</sup> through 8<sup>th</sup> graders at his school where he teaches 6<sup>th</sup> grade. He says, "Once a week meetings begin after Christmas break and lead up to the February School Club Roundup. During SCR club members become third-party operators at lunch time and after school. The two 6<sup>th</sup> grade Science classes also are involved during SCR. This year's SCR week was very short due to two snow days and another day off for a teacher workshop."

Because the sessions are so limited, they have not had any licensed hams emerge from their program. He says that the focus is on communications skills, shortwave propagation, maps and an introduction to the Amateur Radio service. He reports that he uses his own personal equipment for the SCR and has volunteers to help put up a horizontal loop for the contest.

Dave has developed an excellent logging program which can be used in the contest. The program may be found at his own web site: <http://home.earthlink.net/~scr-log>

#### **Deep Woods Elementary School KC5BZA (Round Rock, TX)**

Tina Risinger, KC5BZA, got her school club station started because her husband Ronny, KC5EES, started a club station at LBJ High School where he teaches in Austin, TX. Their children attend Deep Woods Elementary. She says, "I got the "Big Project" training, and here we are! Deep Woods Elementary School is the only elementary in Central Texas with a radio station."

She adds, "Our principal had to cut a lot of red tape, so it took almost two years to get it going. But, the antenna was installed last fall, and we began calling this January." Of course, it's very early in their program but she reports that "...they are all asking about how to get a license! We are showing them how to take the practice tests on line and putting the practice books in the library."

She also says that they got their rig and antenna through the ARRL's "Big Project" and that cable was donated by a local ham. The school paid for the installation. Tina says, "The Principal (Janie Veach) has been fantastic, supporting us at every point. The faculty are interested and are amazed by and pleased to see the student interest.

The students are off the chart excited. They all want to talk and talk lots! The Superintendent's office called to congratulate us on entering the SCR for the first time."

#### **St. Aloysius Radio Club W4KBR (Shepardsville, KY)**

John "Buddy" Sohl, Jr., KC4WQ, is the W4KBR school liaison with the Bullitt (county) Amateur Radio Society in Shepardsville, KY. He explains how the ARRL, local club and active individuals can combine to make a successful school radio club. He says, "The League provided us the Yaesu FT847 to cover 160 through 440 MHz as well as an all-band vertical and 3 element inter-laced Yagi for 2 meter/440 MHz. Also included was the big MFJ tuner and some other odds and ends."

Buddy reports that the tower, two FM mobiles and a 2 meter HT were donated by other local hams. "There has been no cost to the school and very little out of pocket expense for me," says Buddy, "There have been a couple of pieces of equipment donated that have been sold off for operating expenditures and other equipment. One item of distinction was an OLD Hammerlund receiver that had been sitting for over 20 years. It was sold on eBay and brought well over \$100 into the program."

"The Bullitt Amateur Radio Society," Buddy explains, "is the primary sponsor of the school station with assistance from the North Bullitt Contest Group. The program has produced five new licensees. Two have upgraded to general and three have graduated onto local high schools. The most satisfying and gratifying part of the program is to see the kids participate in a "conversation" with someone in another state or another part of the world."

One of the big supporters of the League's Big Project is legendary rock guitarist Joe Walsh, WB6ACU. Last year when W4KBR club members were invited to a local radio station to talk about amateur radio, Buddy sent Joe an e-mail to let him know the kids would be on the radio. Buddy explains, "...[Joe] called in to the radio interview and instead of spending the cursory 5 minutes with us he spent the entire hour chatting with the kids about radio and how it has grounded him during his life."

"I love amateur radio," says Buddy, and he says he wants it to "...continue for another 100 years, but to do that we each need to train our replacements. That is exactly what this type of program can do."

#### **How Long is Your Shadow?**

It ought to be heartening to even the crustiest of old hams to see the energy given by men and women to boys and girls throughout the country in promotion of a hobby which is not only fun but has a critical national security component. It should make you ask yourself: What kind of a shadow do I cast in amateur radio? All of the people mentioned above are ordinary people who are achieving extraordinary results and serve to illustrate that, if you're passionate about radio, there's something you can do to help promote this vital hobby in the school system where you live.

Here's what you can do: Find out if there are any such programs in any of the schools in your

area. If you belong to a local amateur radio club suggest that the club look into sponsoring a school club for elementary, middle or high school. There's bound to be someone in your local club who is a teacher, principal or school board member. Introduce them all to the League's Big Project. But, before you do, get all the facts and study them yourself, so that you can answer basic questions and get the discussion off to a flying start.

You have to remember that starting a school club is a long term project; that nothing about it will be easy; that obstacles will pop up all over to frustrate your efforts, but you must also keep your eyes on the prize. One day a group of eager kids will line up to take their turns at the rig in a future School Club Roundup made possible with your help. Remember, too, that introducing young people to amateur radio doesn't mean they'll all get licenses or that they'll pay any attention to the subject after they're out of school. We all took Biology in school but few of us went on to become career biologists.

If you can't volunteer your time, how about donating a rig? I can't tell you how many times during an on-air QSO hams have spent ten minutes giving me an inventory of all the rigs sitting on shelves in their shacks. Why not stop hoarding rigs and start donating them to local clubs? Imagine how great you'll feel knowing that the local school club is on the air thanks to you!

#### **Last Word**

During the course of last February's SCR contest, I had a chance to work many stations from elementary schools to the Naval Post Graduate School. All of the students were having a great time and, while most operated Single Side Band (SSB), there were some operating CW and digital modes. Know that it's enough just to introduce kids of all ages to the concept of radio communications but don't stop at SSB. Work to broaden the scope of radio studies to include digital modes, Morse Code, AMSATs, construction (kits or home-brewed), antenna theory, and construction. Bring in local experts to help the teacher and show the students how it relates to future careers. This can be particularly important in middle and high school clubs. The potential is endless.

Tina Risinger summed up the excitement of amateur radio in the schools with a few choice quotes from students at Deep Woods Elementary School: "Emily R. says, 'I like to talk to other states.' Jarrod L. said, 'Entering a contest is cool. I like to log the contacts in.' Jonathan W. said, 'Get me a map! I want to look up Prince Edward Island. Where's a map?'"

#### **REFERENCES**

Here's a link to the ARRL's SCR 2007 Roundup: [www2.arrl.org/contests/rules/2007/scr/scr.pdf](http://www2.arrl.org/contests/rules/2007/scr/scr.pdf)

Here's the latest list of Big Project schools. Find out if there's one near you: [www.arrl.org/FandES/tbp/big-proj-schools.html](http://www.arrl.org/FandES/tbp/big-proj-schools.html)

If your area is not represented here's your chance! The Big Project application: [www.arrl.org/FandES/tbp/school-ap.html](http://www.arrl.org/FandES/tbp/school-ap.html)



## Attn: New General Class Upgrades! Welcome to the World of HF

**S**ince February 23, the date at which the Morse code requirement was dropped from amateur radio license testing, an unprecedented number of newly upgraded hams have joined the fray on the High Frequency (HF) bands. The American Radio Relay League (ARRL) reports that from February 23 to April 30 (the most recent reporting date as this is written) 9,500 new Technician Class licensees were added and 10,000 former Techs had upgraded to General Class. That compares with 20,000 new Technician licensees and 3,900 General Class upgrades for *all* of 2006.

The effect of dropping the Morse requirement has been astounding. Many of these hams are coming to HF with virtually no experience on these bands regarding propagation, band plans, operating digital modes, chasing DX, net operations and the generally employed “good on-air practices.”

### ❖ Listen In To Fit In

The best way to fit in on HF is to spend more time listening than talking. So, before you start calling CQ on random HF frequencies, tune around on all the bands and note what's happening.

Some bands, particularly 80 meters at night and 20 meters during the daytime, can sound like a free-for-all. Amid the cussing, deliberate interference and ultra wide-band signals from guys trying to sound like the VOA, there are operators who act as though they were bequeathed an operating frequency directly from Marconi's will. With the small amount of operating space for an increasingly large number of operators, it's bound to get worse. You can do your part to see it doesn't.

Get your operating practices up to speed by starting out on less crowded bands. 10, 12, 15 and 17 meters, when they're open, are much more friendly places to start out. Search the bands and find someone calling CQ. Usually the rule is “if you can hear 'em, you can work 'em.” But, sometimes that's not the case. Some hams running full legal power (1,500 watts) into a modest antenna will have huge signals, but won't be able to receive stations operating at less than a tenth their power. These stations are euphemistically referred to as “alligators,” all mouth, no ears.

Your first dozen or so contacts are crucial. Ask each to tell you how your station sounds. Most hams are critical of other stations' on-air

sound. If there's a problem they'll tell you. If a dozen hams tell you your station sounds great, believe it! If more than two comment that you have audio problems or some other issue, ascertain the problem and resolve it before going on. If only one person out of a dozen has a problem with your station, they probably have problems of their own.

### Round Table

When you come across a group of hams in a QSO, pay attention to how they're operating.

If it's just a “round table” discussion among friends, you'll hear them “pass the mike” from one to the other until it's back to the first. These are usually just a bunch of guys who get together at the same time and frequency each day. Take note of call signs and names while you're listening to help you fit in. Wait until a complete round is finished and, when there's a clear opening, key up and give your call once in proper ITU phonetics. Someone in the group will copy it and announce to the rest that you're standing by. At that time you'll probably be asked to come in and introduce yourself.

### Net Control

If it's a “net” operation, there will be a “net control station” (NCS) who will ID as such and identify the net as well. The NCS will usually be a high powered station with a multi-element beam that can be heard by everyone. If you listen long enough, the NCS will ask, “Are there any other stations who would like to join the net? If so, please come now.” That's your cue to key up and give your call sign once phonetically. If more than one station calls in, they may ask again. Keep giving your call sign once phonetically until you're acknowledged. Typically, the NCS will assign a sequence to the calls in the order received. They'll go down this list until it's your turn to talk. This orderliness is necessary with 10, 20 or even 30 operators in a net. If you call out of sequence or continue to interrupt, you'll only incur the indignation of the NCS and perhaps a few others on the net.



*Forget expensive power draining amplifiers. Put up this inexpensive CushCraft A3s 3 element tri-band beam and be heard everywhere! (Courtesy: Texas Towers)*

### DX Nets

If it's a DX net operation, it can be a little more tricky. In a DX net, an NCS station – usually stateside – will call for “DX check-ins.” That means only hams who have call signs which are outside of the continental U.S. can call in. So, a Canadian, Puerto Rican, Alaskan or Hawaiian ham could call in, but a ham from Key West or Montana could not.

Once the NCS has the DX stations lined up, he or she will say “Anyone wanting to work the DX give me the last two letters of your call.” Now, the reason for this is that the NCS is usually very loud and can be heard by everyone, including the DX stations. If he or she announces your full call, it's unfair to the DX station who should be trying to hear your call sign from your station. If they can't, it's considered a “no contact” and they'll move on. If they can hear your signal, you'll exchange reports and you'll have worked that station legitimately for DXCC (worked 100 countries award).

The problem is that the FCC requires you to make a full ID every 10 minutes that you're on the air, but only after you begin your transmission. To accommodate this, NC stations usually take no more than five check-ins at a time. If you check your clock the minute you announce the last two letters of your call, check it again when you're called to make your DX contact. If 10 minutes have not elapsed, you're still within the FCC rules. Since most contacts in a DX net last no more than 60 seconds each, it's easy to get five DX QSO exchanges on the net during a 10 minute period so that every contact is both legal and ethical.



## ❖ Your First CQ

When you think your operating practices are HF-ready, find a frequency within your license class and monitor it for a few minutes. If there's any interference plus or minus 2 kHz, try moving a little bit one way or the other to make sure you won't interfere with existing QSOs. Key the mike and ask if the frequency is in use and give your call sign phonetically.

Do this three times with a pause of a few seconds between each call. Now give your CQ call. Don't be impatient. If no one calls after the first three or four attempts, wait a minute and do it again. This is particularly true on 10 meters. If the band is open at all, eventually someone will come back to your call. But, to avoid calling yourself hoarse on a dead band, check the beacons. If you can hear any of the beacons for any of the bands, those bands are open. (See feature article on beacons in the May MT.)

## Digital Modes

Since the overwhelming number of new General Class hams are no-code Generals, I'm going to assume you won't be operating CW. But, if you do, the practice is the same. So, too, for the digital modes, but things can be more critical on digital.

Again, you'll learn more about operating do's and don'ts by monitoring the bands before you add to the confusion. BPSK31 is a fairly high-speed digital mode that is very good for poor band conditions. But, if you don't have your rig set up properly you could be ruining QSOs for everyone around you. That's because most digital modes operate within just a few kHz of each other. For example, most 20 meter PSK31 exchanges happen on 14.070 MHz plus only a few kHz. I've counted as many as 15 individual QSOs happening on one frequency. If your signal is overdriven, you will splatter all over everybody else's signals and incur the wrath of all on the frequency.

The key to operating digital modes (PSK31, RTTY, SSTV, etc.) is to have a clean, narrow signal. To help get the best digital signal on the air that you can, turn off your mike processor, cut back your mike gain, and reduce the power output to no more than 25 or 30 watts maximum. Typically, all you need is 10-20 watts for solid contacts world-wide on 30, 20, 15, 17, 12 or 10 meters. The less power everyone uses in the digital modes, the more stations can be on the same frequency. If you have a friend who can operate this mode, it helps to have a QSO with them during which you can make the necessary adjustments.

## ❖ Power, I Need More Power!

You won't be long on the bands before you come across the needle bending 30 over 9 signal of a well-heeled ham running extremely processed audio into a super antenna at the legal power limit. You can tell them right away because they're usually plus and minus 5 kHz from their operating frequency.

But, fancy rigs, huge amplifiers and massive antennas are a real waste of money. To say nothing about the energy they consume and the



*Expensive new rigs will do little more than many older full coverage HF transceivers like this old Kenwood TS-140s which cost a fraction of the price. As a bonus you'll get the best shortwave receiver you've ever owned! (Courtesy: Rigpix.com)*

animosity they create on the bands. A simple 160-10 meter 100 watt rig is all the radio you'll need to do everything you want to on HF. A simple all-band wire antenna up high enough will usually be all you need to make contacts throughout the world and even work the DX pile-ups. If you really need to have a presence on the bands, the most bang for the buck can be had with a simple three-element tri-band Yagi beam, such as the CushCraft A3s. At about \$560, it will make your station sound like a kW and let you be heard all over the world. The beauty of these antennas is that, unlike amplifiers, they cost nothing to operate.

Over the last few years, during the bottom of the current solar cycle, I've worked 240 DXCC countries using the same old Kenwood TS-140s I started out with in 1988. I use an all-band off-center-fed dipole at 25-ft for 80, 60, 40, 30, 17 and 12 meters. I use the CushCraft A3s on a 30-ft mast which I rotate by hand to operate 20, 15 and 10 meters.

That's it! Nothing fancy needed. Forget the power. Your own patience and increased operating skills will net just as many contacts. And remember, the FCC rules state, "An amateur station must use the *minimum* transmitter power necessary to carry out the desired communications." That means don't use more power than you need to make the contact.

Next month: The New Ham's HF Station check list, how to work the DX, and the art of the QSL.

## LED Light Bulbs

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**Q.** *Lately I have been picking up a weak interference signal 24 hours on both my portable and desktop shortwave receivers between 11 and 15 MHz. It sounds like a rapid up/down pitch "eee-ooo-eee-ooo" like a siren. (Ken Backer, Milton, Ont)*

**A.** I have heard similar interference signals on my own shortwave receiver, and I've tracked them down. They are usually traced to microprocessor noise in electronic accessories (computers and peripherals, home entertainment radio and TV, telephone answering machines, etc.).

Here are two proven methods to find the interference:

(1) Carry the portable from room to room; when you approach the offending device, the signal will become much stronger. Unplug the suspect to see if the interference disappears; or

(2) In battery mode, tune in the interference on the shortwave portable, then individually switch off and on the breakers on your power panel while listening for the interference to stop. That will isolate the circuit with the offending device, and you can proceed to that area as in (1).

**Q.** *I have a portable multiband radio that's missing its two telescoping whips, one for shortwave and the other for VHF 30-174 MHz. What would be good choices to use for replacements? (Keith Beesley, email)*

**A.** Radio Shack stocks replacement antennas for portables, so you can start there with the two empty holes, but you will need to be sure you can attach them properly at their bases and that their girth fits the hole.

The shortwave whip will be the longest one you can get that fits, probably 3-4 feet in length. You could use the same model antenna for the VHF slot, fully extended for 30-50 MHz low band, and compressed to about 18"-24" for the high band. Or, if you're in a typical area where there's very little low band communications, you can simply get another whip that pulls out to that shorter length.

**Q.** *I have an ICOM R-3 wide-coverage receiver with TV reception. In what states is it illegal to tune in and observe wireless cameras in operation?*

**A.** To my knowledge it's perfectly legal in any state to watch any wireless video camera signal that's on the air. Radio privacy laws protect voice and scrambling only.

**Q.** *I have heard that the new fluorescent screw-base light bulbs generate radio interference; is that true?*

**A.** Yes, but their interference range is limited to a few feet from the bulb. They radiate wide-band strongest in the AM broadcast band and gradually less so as the frequency rises into the shortwave range. Indoor listeners shouldn't place a fluorescent bulb near a portable radio's whip, but an outdoor antenna would be well insulated from this noise source.

You can easily test this yourself by placing a portable AM or shortwave radio with its whip near the fluorescent bulb and tuning through the bands.

**Q.** *Recently I experimented with my VHF/UHF antenna by attaching it to an HF antenna tuner (transmatch) and feeding it to my shortwave receiver. I was amazed that I actually had signal improvement over my much longer shortwave antenna. Does this mean I can scrap the wire and use my VHF/UHF antenna for shortwave? (Anthony Lenzo, Brooklyn, NY)*

**A.** A receiving antenna does not have to be resonant to work well. The antenna tuner adjusted the mismatched antenna to the 50 ohm impedance of the receiver so that there was very little loss in the line. It also acted somewhat like a preselector, preventing swamping from off-frequency signals.

Decades ago, the U.S. Coast Guard determined that a receiving antenna, properly matched, only needs to be about 5 feet in length to hear virtually 100% of the communications signals. In general terms, an antenna needs only to be long enough to capture enough signal voltage to overcome the receiv-

ing system's own internally-generated noise. Once you have higher signal than that, you gain nothing. It also helps to have directivity in an antenna to null out unwanted co-channel interference and favor the desirable signal.

Shortwave antennas are long, because then they are naturally resonant at impedances which more closely match the nominal 50 ohm input of most receivers.

**Q.** *The AA batteries that came with my hand-held scanner last a good while, but I'd like some that last longer. Is this just a simple substitution of batteries?*

**A.** Yes; the scanner will only discharge the batteries at a specific level, regardless of the current capacity of the battery, just so long as it is the same voltage (which all AA cells of the same chemistry will be). Reader Paul McCay recently informed us that he went to an office supply store and found some Duracell NiMH (nickel metal hydride) AA cells to replace his stock batteries and they lasted a whole lot longer. The key is to read the mAh rating on the AA cell; if it's higher, it will deliver power longer.

**Q.** *I have two shortwave receivers but live in an apartment complex which doesn't allow external antennas. I've managed to put an antenna on a porch, but still get a lot of electrical noise from the apartments. What's the next step? (Jack Feldstein, email)*

**A.** It sounds as if no matter where you put an antenna, you will pick up electrical noise from the building. This is a case where a noise phase-cancellation device is mandatory. I'd suggest the MFJ-1026 (\$189.95) which hooks to your main antenna and also has an input from a random wire noise antenna that is tuned against the receive antenna so the noise can be cancelled out. (See April 2007 MT Review for advice on how to use this product - ed.)

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. Mail your questions along with a self-addressed stamped envelope in care of MT, or e-mail to [bobgrove@monitoringtimes.com](mailto:bobgrove@monitoringtimes.com). (Please include your name and address.)



# MT HELP DESK

## SPECIFIC FREQUENCY AND EQUIPMENT QUESTIONS

Larry Van Horn, N5FPW

[larryvanhorn@monitoringtimes.com](mailto:larryvanhorn@monitoringtimes.com)

**Q.** I have seen a couple of posts on your internet Milcom blog (<http://mt-milcom.blogspot.com>) concerning SGLS. What is it, who uses it, what can I hear and what equipment do I need? (Tom Banks-Dallas, Texas via email)

**A.** Since the late 1960s the Air Force Satellite Control Network (AFSCN), and other satellite support ground systems, have used transmitting and receiving equipment known as the Space-Ground Link Subsystem (SGLS) to provide command and control links with orbiting space vehicles. SGLS, over its nearly three decades of service, has effectively become a defacto standard for satellite tracking, telemetry reception, and commanding (TT&C).

The AFSCN is a global configuration of common user and dedicated control nodes and space/ground link resources whose mission is to support space vehicle telemetry, tracking, and control (TT&C) requirements and to receive, process and disseminate mission data for a variety of operational DoD space systems.

AFSCN currently is supporting 170-plus DoD, Civil and NRO satellite launch and satellite operations in surveillance, navigation, communications and weather. The primary space/ground link resources include nine remote tracking stations (RTS) supporting 16 antennas that operate at S-band using the Space-Ground Link Subsystem.

Although most TT&C operations are provided by fixed sites, the Air Force also uses transportable SGLS-compatible earth stations to provide additional coverage during launches, early orbit operations, anomaly resolution, and critical orbit insertion maneuvers.

The band plan for SGLS comprises 20 discrete channel pairs beginning at 1763.721 MHz and ending with 1839.795 MHz. Each channel is 4.004 MHz wide. These 20 channel pairs (see table below) consist of one uplink and two downlink carriers.

The downlink is transmitted at 1.024 Mbps and uplink rates are 2 kbps. In one type of SGLS system, a subcarrier is modulated by an information signal using BPSK or QPSK modulation. Then the composite signal phase modulates the primary carrier. SGLS provides its users with range, range rate, telemetry and mission data.

Data traffic that uses SGLS includes secure voice or data; image dissemination, intelligence collection, telemetry and command relay, mission data relay, and computer-to-computer data transfer.

Channel No	Uplink (MHz)	Downlink (MHz)
Channel 1	1763.7210	2202.5
Channel 2	1767.7250	2207.5
Channel 3	1771.7290	2212.5
Channel 4	1775.7320	2217.5
Channel 5	1779.7360	2222.5

Channel 6	1783.7400	2227.5
Channel 7	1787.7440	2232.5
Channel 8	1791.7480	2237.5
Channel 9	1795.7520	2242.5
Channel 10	1799.7560	2247.5
Channel 11	1803.7600	2252.5
Channel 12	1807.7640	2257.5
Channel 13	1811.7680	2262.5
Channel 14	1815.7710	2267.5
Channel 15	1819.7750	2272.5
Channel 16	1823.7790	2277.5
Channel 17	1827.7830	2282.5
Channel 18	1831.7870	2287.5
Channel 19	1835.7910	2292.5
Channel 20	1839.7950	2297.5

You can find some excellent S-band equipment recommendations on one of the best websites on the internet for space monitoring information at [www.uhf-satcom.com/sband/](http://www.uhf-satcom.com/sband/). If you want to sleuth many of the world's military satellites, then prowling the SGLS network frequencies is the place to explore.

**Q.** Can you provide website(s) for "A" and "K" indices plus Solar Flux given hourly on WWV? My condo antenna situation is limited, the audio for this on WWV is not as clear as the time announcements, plus with QRM and QRN it is quite difficult to hear the report, usually on 15 MHz and sometimes on 20 MHz late in the day. (Everett F Seidenberg, AG4UM, Stuart, FL)

**A.** My favorite site on the internet is run by frequent MT contributor Tomas Hood at <http://propagation.hfradio.org/>.

There are plenty of links there to other sites on the internet. Speaking of links, the best place on the net to find anything involving amateur radio is Rodney Dinkins AC6V's Amateur Radio and DX Reference Guide. You can find this site at [www.ac6v.com/](http://www.ac6v.com/)

**Q.** My Uniden 246T, while ID scanning my local Public Safety, seems to skip every few seconds after conversation begins on the channel. Is this due to a setting? Please help. (Chris Witczak via email)

**A.** Sounds like you have the priority setting selected. While scanning a conventional system, the scanner interrupts every 2 seconds and checks the priority channels in each unlocked conventional system. Priority channels in lower priority key numbered systems (starting from 1) have highest priority. Look for "Pri" on your screen as it appears when you select this mode.

**Q.** Do you have any air-to-air or any other frequencies for the Hawaii Air National Guard? (Greg Brazil, San Francisco, CA)

**A.** Here is my latest listing for Hickam AFB, Hawaii, from the *Grove Military Frequency Directory*:

141.8000	USAF Command Post
225.4000	USAF Air Traffic Control Training
236.6000	USAF/FAA Ground Control/Ramp Advisory
238.3000	USAF Air Traffic Control Training
239.0500	FAA Approach/Departure Control
251.1500	USAF/FAA ATIS
251.2500	USAF Squadron Common
252.8000	USAF Search and Rescue (SAR)
257.8000	USAF/FAA Tower
269.0000	FAA Approach/Departure Control
270.4000	USAF Ground Controlled Approach
273.5750	FAA Tower ex-267.900 MHz
276.0000	USAF Tower
281.4000	FAA Clearance Delivery
285.4000	FAA As Assigned
292.5000	USAF Command Post
293.7000	USAF 203ARS Operations Hoku Ops
300.1000	USAF Air-to-Ground Contingency
300.6000	USAF Air-to-Ground Contingency
305.4000	USAF ANG Operations
311.0000	USAF ACC Command Post
317.6000	FAA Departure Control
319.6000	USAF Air-to-Ground Contingency Discrete
321.0000	USAF ACC Command Post
327.4000	USAF Air-to-Ground
337.4000	USAF ANG Command/Control Tactical
338.2000	FAA Approach/Departure Control
339.2000	USAF Air-to-Ground
346.6000	USAF Metro
348.6000	FAA Ground Control
349.4000	USAF AMC Command Post
354.2000	USAF ANG Ground Controlled Intercept
372.2000	USAF Pilot-to-Dispatcher (PTD)
396.9000	USAF Ground Controlled Approach

**Q.** In amateur radio, when operating SSB, lower sideband (LSB) is used on the 40M band and below while upper sideband (USB) is used on the 20 meter band and higher. Do commercial users of SSB follow the same or similar type of USB/LSB selection for ordinary voice traffic? (Anonymous via Eric and the UDXF newsgroup)

**A.** In short – No! For the most part, USB will reign supreme in the HF utility bands. There are a few U.S. government entities that will use LSB – FEMA and MARS come to mind. But if you tune in USB you will catch the great bulk of the voice traffic on HF.



## Back to Scanner School

September is back-to-school month around here, and one of the first things covered in the classroom is a review of previous material. We discuss trunked radio systems here on a regular basis, but the technology is a constant source of confusion for many readers.

Dear Dan,

I just recently purchased a PRO-97 1000-channel triple trunking handheld scanner and I am having trouble figuring out how to program the trunked frequencies. I just read your articles on trunking and I understand a little more but not enough to program my scanner.

My questions are

1. What is a control channel and how do I know where to find it?
2. I'm trying to listen to fire and police on their trunked systems. How do I program the scanner?

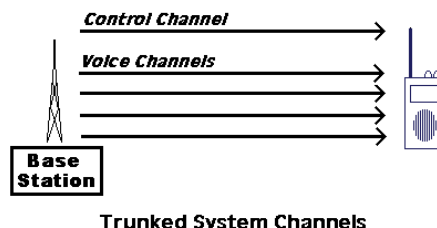
Any help you can offer will be greatly appreciated!

Mark via the Internet

Trunked radio systems use a group of radio frequencies to carry conversations between radios and one or more repeater sites. Repeater sites receive transmissions from radios on their input frequency and transmit them back out on their output frequency, thus *repeating* the conversation for each user to hear. Scanners typically tune to the output frequency of repeater sites, since those signals are usually the strongest. The combination of input and output frequencies is called a *channel pair*, or *channel* for short.

In addition to repeating voice traffic, repeater sites also continuously transmit a separate signal, called a *control channel*. The outgoing (output) control frequency carries instructions and information from the *system controller* out to radios. The incoming (input) control frequency carries requests and acknowledgments from radios in to the system controller. When a radio is not involved in a conversation, it tunes to the control channel and listens for instructions from the system controller.

Conversations on a trunked radio system are organized into *talkgroups*. Each radio is programmed with one or more talkgroup identifiers,



making the radio a member of those talkgroups. When a conversation begins, the system controller selects a radio channel to carry the voice traffic and then sends out a message on the control channel containing the talkgroup identifier and the assigned radio channel. Radios listening to the control channel hear that message and check to see if they are programmed with the talkgroup identifier. If so, they tune to the radio channel and begin participating in the conversation.

So, in order for a scanner to follow a trunked radio conversation, it should monitor the control channel the same way a user's radio would. This means it should also tune to the control channel and listen for messages from the system controller.

This takes us to the second part of Mark's first question: where do you find control channel frequencies?

Prior to the Internet, the most common source of frequency information was guidebooks such as the now-discontinued *Police Call*. These types of books contained license and frequency data from the Federal Communications Commission (FCC) as well as monitor reports from fellow hobbyists.

These days, web sites and electronic user groups have largely replaced guidebooks. These resources are organized in a number of ways, most commonly by geographic area. One of the most comprehensive websites for trunked radio information is Radio Reference at [www.radioreference.com](http://www.radioreference.com). Readers from across the country (and some from other countries) submit frequency and talkgroup information for their local area. The Radio Reference database is organized geographically by country, state and county, so you can zero in on systems in your local area.

Many areas of the country also have electronic user groups dedicated to monitoring local systems. Going to [groups.yahoo.com](http://groups.yahoo.com) and

searching for scanning groups will bring up a number of possible choices for you to subscribe to. Each Yahoo! group has an archive of old messages as well as a file section, allowing you to research old discussions and review documents other members have shared. There are also groups dedicated to specific scanners, so help and advice on particular models are also available.

The Radio Shack PRO-97 is a recent vintage handheld scanner capable of tracking the three most common trunked radio systems (Motorola, EDACS and LTR). The instruction manual describes how to program trunking frequencies beginning on page 67. If you don't have a copy of the manual, Radio Shack maintains electronic versions for most of their scanners on their web site at [www.radioshack.com](http://www.radioshack.com). If the manual still doesn't help or you're still confused, joining the PRO-97 Yahoo! group at [groups.yahoo.com/group/Pro-97/](http://groups.yahoo.com/group/Pro-97/) will give you the opportunity to ask more than 3,700 members for assistance.

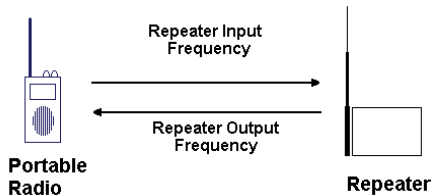
### ❖ Henry County, Virginia



This June, Henry County in southern Virginia took the next step in updating their radio system by voting to award a \$5.2 million contract to Motorola. As with most radio system upgrades these days, the Henry County contract is intended to improve coverage by eliminating "dead zones" and improve reliability by replacing old, outdated equipment. When the contract is complete next year, the 20-year-old Henry County system will be retired.

Henry County is located on the border with North Carolina and is home to about 58,000 people.

The Henry County vote provided an interesting insight into the competing factors faced by local officials making these kinds of contracting decisions. During the public hearing related to the vote, supporters of the second-place bidder, M/A-COM, made a number of points relative



to Motorola and requested a re-examination of each bid. Their arguments boiled down to two basic issues: first, M/A-COM has a facility in Virginia, while Motorola does not. How much weight should the County give to keeping money within the State? Second, and more compelling, is the fact that the M/A-COM bid included newer Internet Protocol (IP) technology while Motorola offered older analog equipment. Is newer always better? Is equipment touted as "future-ready" worth buying even if the County doesn't immediately need it?

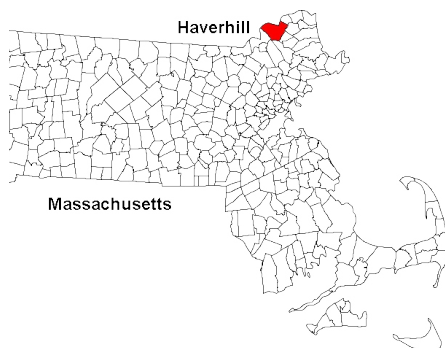
County Board members responded by pointing out that Motorola was the lowest bidder and was understood to have proposed a system that came the closest to meeting all of the County's needs. While newer technology was nice, it wasn't clear that it would be the best value for the County at this time.

Local public safety representatives pushed for action rather than further study, arguing that the dead zones and unreliable equipment are putting residents at risk and should be remedied as soon as possible.

Until the new system is in place, you can hear county activity on the following frequencies:

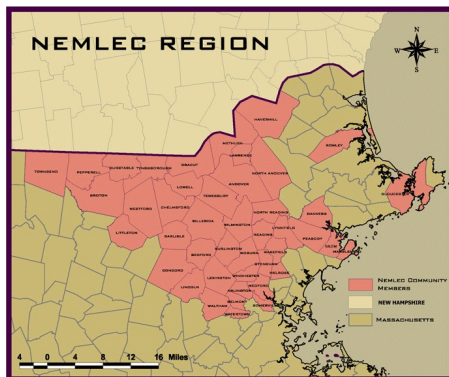
Frequency	Description
39.50	Sheriff
39.54	SIRS Channel
154.180	Fireground
154.250	Fire (Dispatch)
154.265	Fireground
154.295	Tactical
154.815	Sheriff
155.070	Sheriff (Jail)
155.205	Emergency Medical Service
155.220	Emergency Medical Service
155.235	Emergency Medical Service
155.280	Emergency Medical Service
155.340	Emergency Medical Service (Hospital)
155.520	Parks and Recreation
155.610	Sheriff (Dispatch)
155.670	Sheriff (Car to Car)
155.865	Emergency Medical Service (Dispatch)
453.200	Service Authority (Water)

## ❖ Haverhill, Massachusetts



The town of Haverhill, Massachusetts, home to nearly 59,000 people, has voted to spend \$36,000 on two dozen new digital radios. These will replace older radios in the town's 55 police cruisers. The new radios will be paid for through a federal government grant.

Police officials have indicated that one reason for the change is to prevent citizens



from overhearing police conversations. Haverhill currently has the capability of using a technique called *voice inversion scrambling* on their analog equipment. This technique breaks up the voice spectrum into separate blocks, then switches the blocks around. The simplest form of the technique uses only two blocks – low frequencies and high frequencies – and transmits them oppositely, causing the speech to sound like "Donald Duck." Voice inversion scrambling isn't terribly effective in actually hiding the contents of a conversation. Listeners can still make out the basic structure of sentences and with a little practice can make out common words and phrases. There are also after-market devices available (*illegal to sell, but simple to make - ed.*) that can reverse the inversion and restore the normal speech.

Current frequencies in use in and around Haverhill by public safety agencies include:

Frequency	Description
154.0100	Haverhill Fireground
154.3625	Haverhill Fire
460.0875	Haverhill Police
470.3375	Sheriff
470.9250	Haverhill Police
482.5875	Sheriff
482.8875	Sheriff (Jail)
482.9125	Sheriff (Transportation)

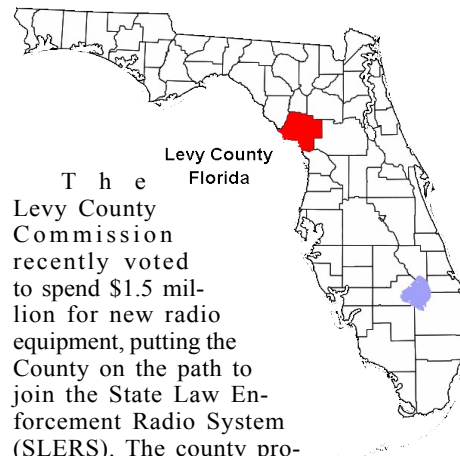
Another reason given for the move to digital radios is interoperability, or at least commonality, with nearby towns. Haverhill, like many other jurisdictions in Essex and Middlesex Counties, is gradually migrating to digital service, although they will continue to transmit messages in analog form until all of their radios can be updated.

Thirty law enforcement agencies in Essex and Middlesex Counties are members of the North Eastern Massachusetts Law Enforcement Council (NEMLEC). NEMLEC members are gradually switching to digital radios and share the following frequencies:

Frequency	Description
482.3875	Tactical 4 (Unit-to-Unit)
482.6375	Tactical 3 (Project 25)
482.6875	Tactical 2 (Areawide)

## ❖ Levy County, Florida

In Levy County, Florida, the small town of Williston, population 2,300, is not joining other local towns in moving to a new county radio system. Currently the county and the town operate independent VHF (Very High Frequency) radio equipment.



The Levy County Commission recently voted to spend \$1.5 million for new radio equipment, putting the County on the path to join the State Law Enforcement Radio System (SLERS). The county provided a grant of \$25,000 to each municipality for communications upgrades. The towns of Cedar Key, Chiefland, and Inglis will change their police equipment, at a cost of about \$4,000 for each portable and mobile radio.

Williston currently dispatches their own police and fire departments and has decided that they're happy with their VHF system and will not be joining SLERS. Communication with the county and other local agencies will be done through the dispatcher via telephone. The city is concerned that there may not be enough local capacity on the SLERS network, leaving their police officers unable to use the system in an emergency. City officials also doubt that the M/A-COM system is as reliable as a competing Motorola system.

# Race Scanning

**Chapters:**

- History of race comms.
- What you can hear
- Racing terms
- Racing flags
- Choosing a scanner
- Tips and tricks
- Racing frequencies

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In spite of these concerns, Williston may use their county grant to begin to phase in 800 MHz radios by purchasing one or two mobile radios and a few portables for police use. This would allow them to try out the SLERS system and make immediate communication with nearby agencies easier without having to commit to switching over. Williston may also try to purchase Motorola equipment if it is compatible with the SLERS M/A-COM infrastructure.

Until the County switches over, you can hear local activity on the following frequencies:

Frequency	Description
154.040	Williston Police
154.055	County Road Department
154.770	Sheriff Dispatch
154.965	County Fire Dispatch (North)
155.235	County Emergency Medical Service (Dispatch)
155.490	Sheriff (Talk-Around)
155.625	County Fire Dispatch (West)
155.700	Sheriff Dispatch
155.880	County Fire Dispatch (South)
155.985	County Fireground (Simplex)
159.255	Williston Fire

SLERS is an unusual partnership between the State of Florida and equipment provider M/A-COM. Due to the enormous cost of building such a large and comprehensive statewide network, both parties agreed to have M/A-COM own and operate the network. In exchange, M/A-COM receives funding from the State and from other users of the network. The State oversees the operation and maintenance of the network, ensuring that it is performing within acceptable bounds.

Because each municipality joining SLERS only needs to purchase the radio equipment they will use, the cost of upgrading to a new 800 MHz system is far less than if each county or large city had to build their own individual network.

SLERS is based on EDACS (Enhanced Digital Access Communications System) technology from M/A-COM. However, there are a couple of problems with monitoring this network.

The first problem for scanner listeners is that the control channel in SLERS uses an optional EDACS product called ESK (EDACS Security Key). ESK allows the system operator (M/A-COM, in this case) to implement a security code in radios and repeaters. This security code is used to scramble the contents of the control channel. In order for the control channel to be understood correctly, the security code in each radio must match the code in each repeater site. Although this feature was originally intended to prevent stolen or otherwise suspect EDACS radios from being used on different networks, it has the additional effect of preventing trunk-tracking scanners from correctly interpreting the control channel. It does not affect voice channels, so scanner listeners are still able to hear individual transmissions.

The second problem is that SLERS uses extended EDACS addressing. Standard EDACS can handle up to about 16,000 unique radio identifiers and about 2,000 talkgroups. Since SLERS is intended to support many more radios and much more activity across the state, it uses a different control channel message format to handle as many as one million unique radios and about 65,000 talkgroups. Unfortunately, scanners do not understand the extended addressing message format.

The SLERS tower in Levy County is licensed for the following frequencies, in Logical Channel Number (LCN) order:

LCN	Frequency
01	853.8500
02	854.0625
03	854.1875
04	857.2625

### ❖ Battle Creek, Michigan

Despite careful planning, new radio systems don't always provide the service needed. Police in Battle Creek, Michigan, have filed a formal complaint about the performance of the city's \$4 million radio system.

Battle Creek is a city of about 54,000, and is best known as the home of cereal makers Kellogg and Post. Back in March, the city, along with the Calhoun County Sheriff Department, Emmett Township and Springfield, moved from their old VHF system to the Michigan Public Safety Communications System (MPSCS). MPSCS is a statewide digital radio network operating in the 800-MHz band.

The police complaint revolves around lack of coverage, especially for officers using portable radios. Dispatchers apparently have difficulty hearing transmissions from the relatively low powered radios in certain locations. There are also locations where officers have a difficult time receiving the dispatcher. This reflects a serious and dangerous situation, according to the Battle Creek Police Department, and has the overall effect of reducing the trust police had in their radios.

Technicians from Motorola, the contractor and equipment provider for MPSCS, have been working with local and state officials. While the situation is being addressed, Battle Creek officers will have their old VHF radios as backup.

While the MPSCS problems get worked out in Battle Creek, check these VHF frequencies for activity:

Frequency	Description
154.250	Fire (Dispatch)
154.295	Fire (Department of Natural Resources)
154.755	Police
155.160	Emergency Medical Service
155.220	Emergency Medical Service
155.370	Police (Intersystem)
155.865	Michigan Emergency Police Service Station (Statewide)
156.105	Multi-County Public Safety Intersystem
156.150	Police (Neighborhood Teams)
159.030	Police

159.210	Fireground
453.375	Police (Parking)
453.650	Department of Public Works
453.975	Transit Authority

The MPSCS operates a repeater site in downtown Battle Creek on the following frequencies: 866.2125, 866.7875, 867.3125, 867.7125, 868.0500 and 868.9875 MHz. There is another tower to the east of the city, transmitting on 866.6000, 866.8750, 867.0875, 867.3750, 867.8750, 868.3750 and 868.8750 MHz.

Unfortunately, much of the Battle Creek Police Department activity on the MPSCS network is encrypted, so even with a digital scanner you probably won't have much luck hearing them.

Decimal	Hex	Description
3025	BD1	County Law Enforcement Information Network
3037	BDD	Battle Creek Police (Narcotics)
3077	C05	County Narcotics Enforcement
3235	CA3	Central Police Dispatch (Patched with 155.535 MHz)
3248	CB0	Battle Creek Police (S.I.U.)
3866	F1A	County Fireground
3875	F23	Battle Creek Police (Dispatch)
3876	F24	Battle Creek Public Safety
3877	F25	Battle Creek Public Safety
3879	F27	Battle Creek Public Safety
3881	F29	Battle Creek Public Safety
3897	F39	Battle Creek Public Safety
3913	F49	Sheriff

### ❖ Val D'Or, Quebec, Canada

Hi,

*I am living in Abitibi, at Val-d'Or. I would like to know if the function Trunk Tracking III on the BC-246T that I want to buy will be useful in Val D'Or. Is there a trunk-tracking system in Val-d'Or? If not, would it be better to buy it anyway or if I can't use the Trunk Tracking III should I buy another handheld scanner?*

*Alexandre in Abitibi*

Val d'Or (Valley of Gold) is a city of about 32,000 people in the southwestern part of the Canadian province of Quebec, about 400 kilometers northwest of Ottawa.

The Uniden Bearcat BC-246T is a handheld trunk-tracking scanner introduced in 2004. It is capable of following analog conversations on Motorola, EDACS and LTR networks. It is not capable of tracking or monitoring transmissions that use digital voice technologies.

Unfortunately, I don't have any information regarding trunked radio systems in Val d'Or, or Quebec in general. If any readers are near Val d'Or and have frequency information for Alexandre, please send me an e-mail and I'll put you in touch.

That's all for this month. You can get more frequencies and radio-related information on my website at [www.signalharbor.com](http://www.signalharbor.com) and I welcome your electronic mail to [danveeneman@monitoringtimes.com](mailto:danveeneman@monitoringtimes.com). Until next time, happy scanning!



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Size: 6 1/16" Wide x 6 1/16" Deep x 2 3/8" High

Frequency Coverage: 25,000-512,000 MHz., 806,000-956,000 MHz.  
(excluding the cellular & UHF TV band), 1,240,000-1,300,000 MHz.

When you buy your Bearcat 796DGV TrunkTracker package deal from Communications Electronics, you get more. The GV means "Great Value." With your BC796DGV scanner purchase, you also get a **free deluxe scanner headphone** designed for home or race track use. Headset features independent volume controls and 3.5 mm gold right angle plug. The 1,000 channel Bearcat 796DGV is packed with features to track Motorola Type I/II/III Hybrid, EDACS, LTR Analog Trunk Systems and Motorola APCO 25 Phase I digital scanner including 9,600 Baud C4FM and CQPSK. Also features control channel only mode to allow you to automatically trunk many systems by simply programming the control channel, S.A.M.E. weather alert, full-frequency display and backlit controls, built-in CTCSS/DCS to assign analog and digital subaudible tone codes to a specific frequency in memory, PC Control and programming with RS232C 9 pin port (cable not supplied), Beep Alert, Record function, VFO control, menu-driven design, total channel control and much more. Our CEI package deal includes telescopic antenna, AC adapter, cigarette lighter cord, DC cord, mobile mounting bracket with screws, owner's manual, trunking frequency guide and one-year limited Uniden factory warranty. For maximum scanning enjoyment, order magnetic mount antenna part number ANTMMBNC for \$29.95. For complete details, download the owners manual from the [www.usascan.com](http://www.usascan.com) web site. For fastest delivery, order on-line at [www.usascan.com](http://www.usascan.com).

### Bearcat® BCT8 Trunk Tracker III

Manufacturer suggested list price \$299.95

CEI Special Price \$169.95

250 Channels • 5 banks • PC Programmable  
Size: 7.06" Wide x 6.10" Deep x 2.44" High

Frequency Coverage: 25,000-54,000 MHz., 108,000-174,000 MHz., 400,000-512,000 MHz., 806,000-956,000 MHz., 849,0125-868,9950 MHz., 894,0125-956,000 MHz.

The Bearcat BCT8 scanner, licensed by NASCAR, is a superb preprogrammed 800 MHz trunked highway patrol system scanner. Featuring TrunkTracker III, PC Programming, 250 Channels with unique BearTracker warning system to alert you to activity on highway patrol link frequencies. Preprogrammed service searches makes finding interesting active frequencies even easier and include preprogrammed police, fire and emergency medical, news agency, weather, CB band, air band, railroad, marine band and department of transportation service searches. The BCT8 also has preprogrammed highway patrol alert frequencies by state to help you quickly find frequencies likely to be active when you are driving. The BCT8 includes AC adapter, DC power cable, cigarette lighter adapter plug, telescopic antenna, window mount antenna, owner's manual, one year limited Uniden warranty, frequency guide and free mobile mounting bracket. For maximum scanning enjoyment, also order the following optional accessories: External speaker ESP20 with mounting bracket & 10 feet of cable with plug attached \$19.95. Magnetic Mount mobile antenna ANTMMBNC for \$29.95.



### Bearcat® BCD396T Trunk Tracker IV

Suggested list price \$799.95/CEI price \$519.95

APCO 25 9,600 baud compact digital ready handheld TrunkTracker IV scanner featuring Fire Tone Out Paging, Close Call and Dynamically Allocated Channel Memory (up to 6,000 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.40" Wide x 1.22" Deep x 5.35" High

#### Frequency Coverage:

25,000-512,000 MHz., 764,000-775,9875 MHz., 794,000-823,9875 MHz., 849,0125-868,9765 MHz., 894,0125-956,000 MHz., 1240,000 MHz - 1300,000 MHz.

The handheld BCD396T scanner was designed for National Security/Emergency Preparedness (NS/EP) and homeland security use with new features such as **Fire Tone Out Decoder**. This feature lets you set the BCD396T to alert if your selected two-tone sequential paging tones are received. Ideal for on-call firefighters, emergency response staff and for activating individual scanners used for incident management and population attack warning.

**Close Call Radio Frequency Capture** - Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. Useful for intelligence agencies for use at events where you don't have advance notice or knowledge of the radio communications systems and assets you need to intercept. The BCD396T scanner is designed to track Motorola Type I, Type II, Hybrid, SMARTNET, PRIVACY PLUS, LTR and EDACS analog trunking systems on any band. Now, follow UHF High Band, UHF 800/900 MHz trunked public safety and public service systems just as if conventional two-way communications were used. **Dynamically Allocated Channel Memory** - The BCD396T scanner's memory is organized so that it more closely matches how radio systems actually work. Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 3,000 channels are typical but **over 6,000 channels are possible** depending on the scanner features used. You can also easily determine how much memory you have used and how much memory you have left. **Preprogrammed Systems** - The BCD396T is preprogrammed with over 400 channels covering police, fire and ambulance operations in the 25 most populated counties in the United States, plus the most popular digital systems. **3 AA NiMH or Alkaline battery operation and Charger** - 3 AA battery operation - The BCD396T includes 3 premium 2,300 mAh Nickel Metal Hydride AA batteries to give you the most economical power option available. You may also operate the BCD396D using 3 AA alkaline batteries. **Unique Data Skip** - Allows your scanner to skip unwanted data transmissions and reduces unwanted birdies. **Memory Backup** - If the battery completely discharges or if power is disconnected, the frequencies programmed in the BCD396T scanner are retained in memory. **Manual Channel Access** - Go directly to any channel. **LCD Back Light** - A blue LCD light remains on when the back light key is pressed. **Autolight** - Automatically turns the blue LCD backlight on when your scanner stops on a transmission. **Battery Save** - In manual mode, the BCD396T automatically reduces its power requirements to extend the battery's charge. **Attenuator** - Reduces the signal strength to help prevent signal overload. The BCD396T also works as a conventional scanner to continuously monitor many radio conversations even though the message is switching frequencies. The BCD396T comes with AC adapter, 3 AA nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, SMA/BNC adapter, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO or ESAS systems. Order on-line at [www.usascan.com](http://www.usascan.com) or call 1-800-USA-SCAN.



### Bearcat® BC246T Trunk Tracker III

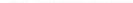
Suggested list price \$399.95/CEI price \$214.95

Compact professional handheld TrunkTracker III scanner featuring Close Call and Dynamically Allocated Channel Memory (up to 2,500 channels), SAME Weather Alert, CTCSS/DCS, Alpha Tagging. Size: 2.72" Wide x 1.26" Deep x 4.6" High

#### Frequency Coverage:

25,000-54,000 MHz., 108,000-174,000 MHz., 216,000-224,9800 MHz., 400,000-512,000 MHz., 806,000-823,9875 MHz., 849,0125-868,9875 MHz., 894,0125-956,000 MHz., 1240,000 MHz - 1300,000 MHz.

The handheld BC246T TrunkTracker scanner has so many features, we recommend you visit our web site at [www.usascan.com](http://www.usascan.com) and download the free owner's manual. Popular features include **Close Call Radio Frequency Capture** - Bearcat exclusive technology locks onto nearby radio transmissions, even if you haven't programmed anything into your scanner. **Dynamically Allocated Channel Memory** - Organize channels any way you want, using Uniden's exclusive dynamic memory management system. 1,600 channels are typical but **over 2,500 channels are possible** depending on the scanner features used. You can also easily determine how much memory is used. **Preprogrammed Service Search (10)** - Makes it easy to find interesting frequencies used by public safety, news media TV broadcast audio, Amateur (ham) radio, CB radio, Family Radio Service, special low power, railroad, aircraft, marine, racing and weather frequencies. **Quick Keys** - allow you to select systems and groups by pressing a single key. **Text Tagging** - Name each system, group, channel, talk group



ID, custom search range, and S.A.M.E. group using 16 characters per name. **Memory Backup** - When power is lost or disconnected, your BC246T retains the frequencies that were programmed in memory. **Unique Data Skip** - Allows the BC246T to skip over unwanted data transmissions and birdies. **Attenuator** - You can set the BC246T attenuator to reduce the input strength of strong signals by about 18 dB. **Duplicate Frequency Alert** - Alerts you if you try to enter a duplicate name or frequency already stored in the scanner. **22 Bands** - with aircraft and 800 MHz. The BC246T comes with AC adapter, 2 AA 1,800 mAh nickel metal hydride batteries, belt clip, flexible rubber antenna, wrist strap, RS232C cable, Trunk Tracker frequency guide, owner's manual and one year limited Uniden warranty. For more fun, order our optional deluxe racing headset part #HF24RS for \$29.95. Order now at [www.usascan.com](http://www.usascan.com) or call 1-800-USA-SCAN.

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Bearcat 246T up to 2,500 ch. TrunkTracker III handheld scanner.....	\$214.95
Bearcat Sportcat 230 alpha display handheld sports scanner.....	\$184.95
Bearcat 278CLT 100 channel AM/FM/SAME WX alert scanner.....	\$129.95
Bearcat 248CLT 50 channel base AM/FM/weather alert scanner.....	\$104.95
Bearcat 92XLT 200 channel handheld scanner.....	\$109.95
Bearcat 72XLT 100 channel handheld scanner.....	\$99.95
Bearcat BR330T up to 2,500 ch. TrunkTracker III with Tone out.....	\$274.95
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Bearcat 350C 50 channel desktop/mobile scanner.....	\$104.95
AOR AR16BQ Wide Band scanner with quick charger.....	\$199.95
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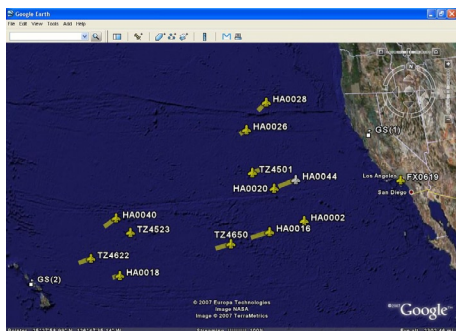
## PC-HFDL: A Good Program Gets Better

In early July, a new beta version appeared for one of the High-Frequency Data Link (HFDL) decoding programs discussed in the June column. The author, ace programmer and generally smart guy Charles Brain, G4GUO, submitted it to the exact people guaranteed to give it a real test. These were, of course, the hard-core HFDL monitors on the Yahoo group at <http://groups.yahoo.com/group/hfdl/>.

The new version is PC-HFDL 2.04, for Windows XP (no Vista yet). So far, it seems like a major improvement. I didn't have the startup problem reported by others, where the pchfdl.ini file in the beta distribution attempted settings that not all sound cards would do. I saved my old initialization file in case the installer overwrote it, but it didn't.

I checked out the program on a lot of Pacific flights working Molokai on 11312.0 kilohertz (kHz), upper sideband (USB). The user interface is nearly the same, but some definite improvements are evident "under the hood." The decoder works a bit better. The "squitters" look the same, but they're handled a little more nicely. According to Charles, the acquisition of the new system table should work much better when the time comes.

The most visible difference comes if you're using Google Earth. This application is now supported for plotting aircraft positions obtained with the program.



The implementation is very basic, but slick. According to Charles, PC-HFDL formats the position data recovered from the HFDL transmissions into Google Earth's Keyhole Markup Language (KML). These are written to a file, then Google Earth is instructed to load it, plus another one with the coordinates and likely frequencies of the ground stations.

If you've detected any airplanes, Google Earth will swing around dizzily, and happily display the positions and flight numbers. It's also fun, of course, to zoom in on the ground stations. I highly recommend looking at San

Francisco/Dixon, station 01. High resolution images of the Dixon area have recently been added, and the coordinates put you right in the middle of the old Voice of America site now being used by the HFDL station and Globe Wireless. While you're there, look immediately southwest for a nice US Navy setup. (Also see June issue for VOA Dixon pictures - ed.)

As new aircraft are plotted, Google Earth is updated to show them, sometimes again with dizzying results. Certain pairs of coordinates jump the plot to Africa, though I quickly learned to stop this with a quick mouse grab. I did have one plane show up (accurately) on the runway of the Lima, Peru, international airport, and another right at the departure end of Los Angeles International (LAX) runway 24 Left. It's nice to have the detailed images!

Just one bit of advice, though. Don't forget to delete all the airplane positions from your temporary placemarks when you close Google Earth. Otherwise, they will come up next time, filling up your placemark list and generally confusing everything.

In my own opinion, the improvements to PC-HFDL are worth it. A good program just got better.

### ❖ VHF HFDL Counterpart Now Active

In response to our June column, Larry Major, KB3KAK, writes as follows:

"Actually, the new ACARS [Aircraft Communication Addressing and Reporting System] has been in service since 2002/2003; it is known as VHF [Very High Frequency] Data Link (VDL) Mode 2. It uses a CSMA [Carrier Sense Multiple Access] D8PSK [Eight-Ary Differential Phase-Shift Keying] waveform. Both ARINC [Aeronautical Radio, Incorporated] and SITA [ARINC's European counterpart] have implemented VDL Mode 2 networks in parallel with their traditional ACARS networks in much of the world. Around the world some 2200 commercial (40 airlines) and military aircraft have already transitioned to ARINC's VDL Mode 2, sending some 3 million messages a month."

Larry cites an ARINC press release dated June 20, 2007. It reads, in part:

"VDL Mode 2 provides expanded radio channel capacity, vitally needed for Aeronautical Operational Control (AOC) and Air Traffic Control (ATC) data link services in much of the world's crowded airspace... The expanded bandwidth of VDL Mode 2 - ten times that of ACARS - allows ARINC to offer a whole new

range of flight information and AOC applications for airlines, including graphical weather, electronic charts, and engine/aircraft health monitoring programs. VDL Mode 2 also supports traditional ACARS data link applications via a hybrid service known as AOA, or ACARS Over AVL (Aviation VHF Link Control)."

The full release is at [www.arinc.com/news/2007/06-20-07.html](http://www.arinc.com/news/2007/06-20-07.html). We thank



Larry for this clarification of what's going in the VHF portion of ARINC's GLOBALink service, which also integrates satellites and HFDL.

### ❖ XSS is TASCOMM?

Last month, we wrote about the identification of the once-mysterious "XSS" net as the new military communications system for the United Kingdom (UK). This active Automatic Link Establishment (ALE) network became active some months back, but it was only recently identified from traffic and signal characteristics.

XSS is the ALE address of the most active station, perhaps a headquarters or control point. All other stations so far also have 3-letter addresses beginning in X, except for two E-3 Airborne Warning And Control System (AWACS) aircraft. These are UKE306 and UKE307 - United Kingdom E-3s number 6 and 7.

There's been a lively discussion on the precise scope of the XSS net. It is either the entire system, known as the Defence High Frequency Communications Service (DHFCS), or a subnet called Terrestrial Air Sea Communications (TASCOMM).

Michael, DH5FAU, might have an answer. He logged XSS calling itself "TASCOM" in an ALE Automatic Message of the Day (AMD) text. Many agencies pass little operator-chatter type strings in this field.

These are the kinds of details which can provoke a great deal of discussion within the utility community. Perhaps we now have an answer, and XSS is TASCOMM. Stay tuned, as they say.

While we're on the subject of "XSS," we'd also like to thank MT's own Larry Van Horn, who supplied most of the callsigns and frequencies mentioned last month. This is some good work. See you in another month, and enjoy the fall DX!



### ABBREVIATIONS USED IN THIS COLUMN

AFB.....	Air Force Base
ALE.....	Automatic Link Establishment
AM.....	Amplitude Modulation
ASCII.....	American Standard Code for Information Interchange
CAMSLANT.....	Communication Area Master Station, Atlantic
CW.....	On-off keyed "Continuous Wave" Morse telegraphy
DEA.....	US Drug Enforcement Administration
E03.....	UK M16/SIS, musical callup and female voice
E10.....	Israeli intelligence/military, female phonetic voice
E11.....	Unknown "Strich" family, null-message format in English
E25.....	Unknown, possibly Egypt, irregular music and messages
EAM.....	Emergency Action Message
EOC.....	Emergency Operations Center
FAX.....	Radiofacsimile
FBI.....	US Federal Bureau of Investigation
FEC.....	Forward Error Correction
FEMA.....	US Federal Emergency Management Agency
FM.....	Frequency Modulation
HFDL.....	High-Frequency Data Link
HF-GCS.....	High-Frequency Global Communication System
JSTARS.....	Joint Surveillance Target Attack Radar System
LSB.....	Lower Sideband
MO8a.....	Cuban 3-msg CW/MCW, ANDUWRIGHT = 1-0
MARS.....	Military Affiliate Radio System
MCW.....	Modulated CW, also Morse tones in AM
MX.....	Russian single-letter CW cluster propagation beacons
NASA.....	US National Aeronautics and Space Administration
NPHRN.....	National Public Health Radio Network
RTTY.....	Radio Teletype
SHARES.....	Shared Resources (US Government)
SITOR-B.....	Simplex Telex Over Radio, FEC teleprinting mode
Unid.....	Unidentified
US.....	United States
USCG.....	United States Coast Guard
UK.....	United Kingdom
V02a.....	"Atencion" Spanish numbers, 3-msg format
VHF.....	Very High Frequency

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations have their ENIGMA (European Numbers Information Gathering and Monitoring Association) designators in ().

60.0	GBZ-New UK standard time signals, Anthorn, at 2338. (Ary Boender-Netherlands) [Replaces closed MSF Rugby site. - Hugh]
75.0	HGB-Standard time signals, Prangins, Switzerland, at 2340. (Boender-Netherlands)
77.5	DCF77-Standard time signals, Mainflingen/Frankfurt, Germany, at 2341. (Boender-Netherlands)
129.1	DCF49-European power grid control, Mainflingen, Germany, ASCII at 1120. (Boender-Netherlands)
135.6	HGA22-European power grid control, Lakihegy, Hungary, ASCII at 1634. (Boender-Netherlands)
139.0	DCF39-European power grid control, Burg, Germany, ASCII at 1118. (Boender-Netherlands)
147.3	DDH47-Deutsche Wetterdienst (German Weather Service), RTTY marker at 0023. (Boender-Netherlands)
2474.0	PBB-Dutch Navy, Den Helder, Holland, RTTY marker, also on 4280, at 1347. (Boender-Netherlands)
3150.0	PCD-Israeli intelligence (E10), AM callup and message, simulcast on 3270, at 0235. (Boender-Netherlands)
3341.0	MW5FEM-FEMA Region 5, ALE sounding at 1149. (Ron Perron-MD)
3782.0	CTP-Portuguese Navy, RTTY marker with notice that "ship shore not available," at 0042. (Boender-Netherlands)
3855.0	DDH3-German Weather Service, FAX chart at 1159. (Boender-Netherlands)
4070.0	GYA-UK Royal Navy, Northwood, FAX weather charts, supposed to be on 4610 kHz, at 2029. (Boender-Netherlands)
4506.0	Unknown-Various US Civil Air Patrol pilots, checking in with North Central headquarters net at 0145. (Jeff Seale-KY)
4610.0	GYA-UK Royal Navy, FAX weather charts, back on the regular

4724.0	frequency after two days on 4070, at 0826. (Boender-Netherlands)
4724.0	Yale Man-US Military, with a 28-character EAM simulcast on 8992 and 11175 HF-GCS, at 0131. (Jeff Haverlah-TX)
4757.0	KEY798-US Environmental Protection Agency, ALE sounding, also 4442, 10202, 13488, and 20659, at 2053. (Perron-MD)
5058.5	SE-FBI, Seattle, WA, calling AN1, Anchorage, AK, ALE at 0904. (Mark Cleary-SC)
5339.0	KPA2-Israeli intelligence (E10), AM callup only, at 0219. (Boender-Netherlands)
5343.0	Z57B-UK Royal Cadets, annual radio contest at 2132. (Boender-Netherlands)
5598.0	New York-North Atlantic air route net A, working airliner Delta 114, at 0514. (Seale-KY)
5711.0	Cape Radio-US Air Force, Cape Canaveral Air Force Station, FL, working NASA Booster Recovery Director and Booster Recovery Vessel Freedom Star, before shuttle launch, at 2244. (Cleary-SC)
5732.0	Hammer-US Customs, CA, giving VHF working channel to Omaha 3MR for a helicopter and USCG Cutter Confidence, at 0113. (Cleary-SC)
5746.0	Lincolnshire Poacher-UK Intelligence, Cyprus (E03), message in progress, parallel 6959 and 9251, at 2223. (Boender-Netherlands)
5778.5	R26611-US Army helicopter, calling B1Z171 (1-171st Aviation), ALE at 1922. (Cleary-SC)
5820.0	WGY9030-Unknown FEMA, working WGY9025, and OH5, Dayton, OH, on the NPHRN net, at 1426. (Jack Metcalfe-KY)
5821.0	WGY901-FEMA Region 1, Maynard, MA, calling the net with WGY963 (VA State EOC, Richmond), WGY941 (ME State EOC, Augusta), and WGY902 (New York, NY), at 1501. (Metcalfe-KY)
5833.5	G23691-US Army helicopter, calling STPOPS, Army Aviation Support Facility, St. Paul, MN, ALE at 0219. (Cleary-SC)
5901.0	USDAEOC2-US Department of Agriculture alternate EOC, ALE sounding at 2104. (Metcalfe-KY)
6314.0	NMF-USCG, Boston (remote to CAMSLANT, VA), SITOR-B maritime safety information, at 0208. (Seale-KY)
6586.0	New York-Caribbean air route net B, working airliner Jet Blue 707, at 0518. (Seale-KY)
6661.0	Northwest 170-Airliner with HFDL position for ground station 04, Riverhead, NY, at 0204. (Seale-KY)
6694.0	Halifax Military-Canadian Forces, NS, coordinating data transmissions with submarine Corner Brook, at 0357. (Michael Lovell-Canada)
6697.0	Rent A Car-US military, EAM at 2240. (Cleary-SC)
6824.0	ABC2-Israeli intelligence (E10), AM test callup at 2148. (Boender-Netherlands)
6840.0	JSR2-Israeli intelligence (E10), AM callup only at 0234. (Boender-Netherlands)
6855.0	Cuban Spanish AM female "numbers" (V02a), callup 49321 41503 20513, at 2102. (Cam Castillo-Panama)
6908.5	294-US Defense Logistics Agency, Columbus, OH, calling TEST001DLAGLOB (presumably DLA Global test), ALE at 1633. (Perron-MD)
6910.0	R23354-US Army helicopter, calling T12CAB (12th Combat Aviation Brigade), ALE at 0214. (Cleary-SC)
6911.5	R23008-US Army helicopter, calling KMUING, Muir Army Air Field, ALE at 0035. (Cleary-SC)
6985.0	R23732-US Army helicopter, calling T12 (12th Aviation), ALE at 1130. (Cleary-SC)
7038.7	"D"-Russian Navy CW cluster beacon (MX), Odessa, at 2050. (Mike L-West Sussex, UK)
7038.8	"P"-MX, Kaliningrad, CW at 2051. (Mike L-UK)
7038.9	"S"-MX, Arkhangelsk, CW at 2051. (Mike L-UK)
7039.0	"C"-MX. Moscow, abnormal CW format repeating "C" 5 times, then Cyrillic Morse character "dah dah dah dit" once, at 2052. (Mike L-UK)
7300.0	WRCCBUFFALO-US National Power Grid, NY, sounding in LSB ALE at 2137. (Perron-MD)
7337.0	Lincolnshire Poacher (E03), message in progress, parallel



- 9251 and 12603, at 2126. (Boender-Netherlands)
- 7361.5 T12-US Army, calling helicopter R26860, ALE at 2138. (Cleary-SC)
- 7527.0 Panther-DEA, Bahamas, working USCG Rescue 33 on a search, at 1357. (Cleary-SC)
- 7703.0 "Foxtrot-0-Sierra"-Probable US Navy, with four EAMs at 0125. "Kilo-2-Yankee"-US military, repeated three of the EAMs, at 0135. (Haverlah-TX)
- 7880.0 DDK3-German Weather Service, FAX chart at 1159. (Boender-Netherlands)
- 7896.0 Cuban AM "numbers," (V02a), new voice, in progress at 2006. (Castillo-Panama)
- 7903.5 AL1-FBI, Albany, NY, calling IP1, Indianapolis, IN, ALE at 1700. (Cleary-SC)
- 8023.0 003CDC09-US Centers for Disease Control, ALE sounding on NPHRN, at 1359. KEY798-US Environmental Protection Agency, ALE sounding on NPHRN, at 2248. (Perron-MD)
- 8040.0 GYA-UK Royal Navy, FAX weather charts at 1249. (Boender-Netherlands)
- 8040.0 TF131-AL National Guard 1-131st Aviation Company "F," Birmingham, ALE sounding at 1710. (Perron-MD)
- 8056.0 297-US Defense Logistics Agency, Philadelphia, PA, calling 294 (OH), ALE at 1445. (Perron-MD)
- 8097.0 Cuban MCW "cut numbers" (M08a), 5-letter groups in progress at 1833. (Castillo-Panama)
- 8181.5 R26881-US Army helicopter, calling KALBNG, Albany, NY, ALE at 0124. (Cleary-SC)
- 8181.5 T3Z238-MI National Guard 3-238th Aviation, calling MA-VNSR, unknown Guard unit, ALE at 1428. T3Z238, calling MIC51NG, 51st Weapons of Mass Destruction Civil Support Team, Augusta, MI, ALE at 1504. (Perron-MD)
- 8280.0 BRIFFR-Venezuelan Navy River Base, calling PNME5 (Venezuelan Navy, Rio Meta), LSB ALE at 0153. (Perron-MD)
- 8500.0 PR1-Venezuelan Navy Radio Station #1, calling PR4, ALE at 2246. (Perron-MD)
- 8912.0 33C-US Joint Task Force, setting radio guard with Panther, Bahamas, at 1448. (Cleary-SC)
- 8992.0 Dewey 07-US military, traffic for Corn Snow, at 0105. Andrews-US Air Force HF-GCS control, Andrews AFB, MD, with a distinctively repetitive 121-character EAM, at 1418. (Haverlah-TX) Deuce 28-US Air Force tanker, traffic with Offutt AFB, NE, at 0328. (Lovell-Canada)
- 9040.0 Cuban Spanish AM female "numbers" (V02a), in progress at 1005. (Perron-MD)
- 9106.0 KNY70-SHARES, Herndon, VA, ALE sounding at 1345. (Cleary-SC)
- 9121.0 294-US Defense Logistics Agency, OH, calling 299 (Defense Logistics Agency, New Cumberland, PA), at 1418. (Perron-MD)
- 9143.5 ANG-Unknown VA National Guard asset, ALE sounding at 2320. (Perron-MD)
- 9025.0 OFF-US Air Force, Offutt AFB, NE, calling aircraft 538022, ALE at 1900. (Hugh Stegman-CA)
- 9414.5 KFD905-US Department of Agriculture Headquarters, Washington D.C., NPHRN voice check in with FEMA WGY9030, then ALE as USDAHQ1, at 1641. (Metcalfe-KY) WGY9441-FEMA auxiliary station, ALE sounding at 2019. (Cleary-SC)
- 9450.0 Unid-Unknown "numbers" station (E25), testing with multiple tones in AM, then playing its typical Middle Eastern music, no messages, at 0710. E25, testing with Middle Eastern music only, huge AM signal on and off after 1920. (Mike L-UK)
- 9576.0 Unid-Unknown "numbers" station with callup "232 Oblique 00" and no message (E11), at 0845. E11, callup 284/00 only, at 0915. (Mike L-UK)
- 10125.0 Unid-Unknown "numbers" station, callup 186/00 (E11), slower than usual, at 1230. (Mike L-UK) Cuban CW "cut numbers" (M08a), 5-letter groups in progress at 1833. (Castillo-Panama)
- 10202.0 119CDCS05-US Centers for Disease Control, ALE sounding at 0255. (Perron-MD)
- 10780.0 Cape Radio-US Air Force, radio check with NASA Booster Recovery Vessel Freedom Star on shuttle launch countdown, at 1504. (Cleary-SC)
- 10821.0 T1126-Possible US Army, ALE sounding at 1642. (Perron-MD)
- 10993.6 Coast Guard 6008-USCG helicopter, over a target of interest with Sector Key West, FL, and Shark 23 (probable USCG Cutter Drummond), at 2030. (Cleary-SC)
- 11086.5 GYA-UK Royal Navy, FAX weather charts at 1235. (Boender-Netherlands)
- 11108.0 WGY908-FEMA Region 8, Denver, CO, phone patch test with possible WGY955 (IL State EOC, Springfield), at 1444. (Metcalfe-KY)
- 11175.0 Curly Top-US military, probably "Nightwatch" airborne command net, setting up comm with Horn Rack in a patch via Offutt HF-GCS, at 0155. Skull 02-Probable US Air Force or Air National Guard, attempting HF-GCS patch to Magic Control, no joy, so did a commercial patch to Cigar, at 0436. (Lovell-Canada) Anti Trust-US Military, patch via McClellan HF-GCS to Offutt AFB, passing orderwire traffic for Deck Boat, at 0250 and 0300. Andrews-Andrews AFB HF-GCS control point, MD, with a distinctively repetitive 125-character EAM, at 1522. (Haverlah-TX) NASA 928-NASA WB-57F high altitude research aircraft, patch via Offutt HF-GCS to Houston regarding photo recon of the space shuttle re-entry, at 1651. (Allan Stern-FL)
- 11220.0 Fury 12-US Air Force B-2A, secure voice check with Offutt at 1442. (Cleary-SC)
- 11232.0 Punch 22-US Air Force E-8 JSTARS, patch via Trenton Military to Peachtree (Robins AFB, GA), at 2153. (Cleary-SC)
- 11545.0 Lincolnshire Poacher (E03), identifier "44136," parallel 13375, at 1600. (Boender-Netherlands)
- 11551.5 103-Unknown agency, calling 100 in ALE, at 2110. (Perron-MD)
- 11565.0 EZ12-Israeli intelligence (E10), AM callup only, parallel 13533, at 0403. (Boender-Netherlands)
- 12068.5 291-US Defense Logistics Agency, Richmond, VA, calling DLGLOBALNET (presumably DLA Global Net) in ALE, also on 6908.5, 8056, and 9121, at 1311. (Perron-MD)
- 12164.0 WNG981-Unknown US State Department, ALE sounding at 1328. (Perron-MD)
- 12528.5 6E78-Venezuelan Navy/ Coast Guard Riverine Forces, calling T5L1 (possible Navy headquarters), LSB ALE at 0300. (Perron-MD)
- 13200.0 Offutt-US Air Force HF-GCS, Offutt AFB, NE, with three EAMs, middle one with 125 characters, at 1600. Andrews HF-GCS, three shorter EAMs at 1630. (Haverlah-TX)
- 13488.0 WGY9441-FEMA, calling WGY9030, also sounding on 10202 and 20659, at 1840. (Perron-MD)
- 13855.0 OXT-Copenhagen Meteorological, Denmark, identified in CW then sent ice chart FAX, at 1220. (Boender-Netherlands)
- 13882.5 DDK6-German Weather Service, FAX chart at 1159. (Boender-Netherlands)
- 13927.0 AFA2XD-US Air Force MARS, FL, patching Evac 39 to base ops for arrival ambulance request, at 1424. AFA2MH, GA, patch with Keys 81, a MS Air National Guard tanker, also at 1424. AFA1QW, IN, morale patch for Pitt 13, a US Air Force C-130H, at 1445. (Stern-FL) Teal 14-US Air Force Reserve 53rd Weather Recon, WC-130J "Hurricane Hunter," patch via US Air Force MARS AFA1WP, at 1957. (Cleary-SC)
- 14015.0 PUN-Pirate radio beacon, Pista Las Peñas, Ecuador, CW at 2357. (Castillo-Panama)
- 14487.0 Lincolnshire Poacher (E03), weak at 1203. (Boender-Netherlands)
- 14776.0 WGY908-FEMA, CO, testing voice, ALE and RTTY with WGY911 (FEMA, Maynard, MA), at 1436. (Metcalfe-KY)
- 15016.0 Unid-Station said call too fast to copy, probably US military, with a long 174-character EAM, at 0120. (Haverlah-TX)
- 17026.0 KFS-Special historic maritime station, CA, test wheel in CW at 2218. (Stegman-CA)
- 17478.0 Cuban AM "numbers," (V02a), callup 81268 37874 24053, at 1603. (Castillo-Panama)
- 17480.0 Cuban AM "numbers," (V02a), new voice, in progress at 1604. V02a, old voice in AM, two days later at 1613. (Castillo-Panama)
- 18261.0 GYA-UK Royal Navy, FAX service for Persian Gulf forces, at 1723. (Boender-Netherlands)
- 20659.0 WNG920-NY State Department of Health, Albany, voice with FEMA WGY9030, then ALE as 001CDCS36, at 1844. (Metcalfe-KY)
- 24740.0 294-Defense Logistics Agency, OH, calling 309 (DLA, Battle Creek, MI), ALE at 1426. (Perron-MD)
- 27910.0 WBAP-Auxiliary cueing feed from commercial broadcast station, TX, simulcasting non-delayed program audio in narrowband FM, and showing possible tone-protection hum, at 0255. (William Hassig-IL) [Probable sporadic-e skip; nice catch. -Hugh]

## Digital Utility Myths

**S**purred on by a recent UDXF posting, this month we take a look at one of the continuing myths of digital utility listening: the abundance of weather, press and other RTTY based services.

### ❖ XSS Mystery ALE Network Identified

Before we do, the mysterious “XSS” ALE network, so named after the callsign used by the main net control station, seems to have been finally identified. Back in the August 2006 issue of *MT*, we speculated that XSS was located in the UK and that this was probably a UK operated network. The purpose, callsigns and frequencies used by the network were well covered in last month’s *Utility World* column, so we’ll concentrate more on how the trail led to the origin of this station being uncovered.

XSS first appeared a couple of years ago with a few three letter Xxx outstations on a few frequencies, but it very quickly expanded to a large network with many channels. Propagation almost certainly pointed towards a European-based network, and we had first speculated that the network was a test system built by NATO’s NC3A Communications Research group. This theory was coming from a number of presentations at the HF Industry Association website (HFIA, see Resources) that detailed timelines approximately fitting with the appearance of the network.

In late 2006, we had some further private information that pointed towards a UK MOD (Ministry of Defence) project, but with little other indication of the precise user. Last month, some enterprising listeners on the Utility DXers Forum (UDXF) finally got around to the only real way of figuring out the originators of the signals: plugging all the network frequencies into the PC-ALE program; scanning day and night and analyzing the signal strength, time, and propagation; and using directional antennas to roughly identify the source of the signal.

We don’t know if anyone went to the final step of getting in a car and traveling to known transmitter sites to finally nail the signal, but with the frenzy of interest came more information from the HFIA website that indicated that XSS was most probably the new Defence HF Communications System (DHFCS) network. The HFIA document from contractor Rockwell Collins shows a net control station (NCS), an alternative NCS, transmitter sites in the UK (two sites: Forest Moor and one other), Gibraltar, Cyprus, Ascension Island and Falkland Islands.

As Hugh mentioned last month, final con-

fimation came in the form of a giveaway ALE link check between XSS and “UKE306,” the ALE identifier of a NATO Boeing E3DAWACS aircraft based at RAF Waddington on England’s East Coast. Further ALE AMD (similar to mobile phone text messages) have also been seen mentioning TASCOMM and other agencies supported by this network.

Traffic is infrequent on the network and consists mainly of ALE soundings and occasional bursts of MIL-188-110A high speed modems that send on-line encrypted traffic – not even a lead-in or lead-out signature is present.

### ❖ Where did all the RTTY go?

As we’ve documented steadily in the column over the last decade, simple Baudot RTTY transmissions of weather, press and aeronautical traffic are all but gone now. The problem is that a plethora of old frequency lists, handbooks and websites still detail all of this stuff, confusing especially new listeners with the promise of news from China, Tripoli and other far flung places. Barely a week goes by on the HF listener lists without someone asking where they can find these transmissions or why they haven’t heard anything after a week of monitoring, or (perhaps worse), without them suspecting that their gear is broken.

Unfortunately, the truth is that most RTTY is gone.

There are a few exceptions you can try for:

- **Hamburg (Pinneberg) Meteo continues to provide weather and sea conditions for Europe using good old fashioned 50bd/425Hz shift Baudot RTTY on 4583, 7646, 10100.8, 14467.3 and 15988 kHz.**
- **Rome, using callsign IMB32, also transmits occasionally on 5887.5 kHz using 50bd/850 Hz shift RTTY.**
- **Bucharest, using callsign YRR4 on 5731 kHz using 50bd/400 Hz shift Baudot RTTY.**

To our knowledge, there is longer any HF press service nor aeronautical stations on the air.

In a recent post to the UDXF group, listener Bob Hall lamented the loss of these stations and modes, and at the same time told us that ALE simply wasn’t exciting to him. It’s a pity, since as we’ve shown over the years in this column, many of the organizations migrating to newer, faster and often ALE-enabled equipment still retain their old frequencies, identifiers and habits. They are still there, and in many cases, we only know that because of our ability to decode signals like ALE.

Hopefully, too, the resourcefulness displayed by the UDXF group in gradually putting the pieces of the puzzle of the XSS network together shows how exciting using ALE can be.

### ❖ Some old modes do come to life!

Finally, two old modes were recently spotted.

A British Army or Navy two channel Piccolo-6 VFT was heard on 18421.81 and 18422.21 this month. Our suspicion has long been that these systems are probably now only used by reserve units on exercise or for cadet training and are very rarely heard. Piccolo-6 can be decoded by a number of programs. The trick with this system is to tune to the center of the usually idling “engineer’s channel” which lives on the lower of the two channels on the +510Hz offset. This occasionally sparks into life with operator chatter and often provides a legitimate British, usually M-series or G-three letter callsign.

We were also surprised to see listener Kristian K. see another blast from the past – a German Air Force three-channel FEC-A VFT. These machines use three channels of 192bd/170 FEC-A spaced at 690 Hz running in time delay mode.

Kristian heard them being used on 6830.5 kHz, using callsigns DHJ43 and 1Z5X with a combination of encrypted and plain text traffic. FEC-A also appears on the menu of many decoding programs and can be easily decoded. Until a year or so ago, FEC-A from the French diplomatic stations was a daily occurrence but have since left the air.

## RESOURCES

HF Industry Association:  
[www.hfindustry.com](http://www.hfindustry.com)

### Antenna Designer

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## Italy Quitting Shortwave? Austria Stays; Finland Could Come Back

Reports have been circulating for months, but the time seems to be near for Rai to abolish its shortwave service, especially Eastern European languages, which are seen as a relic of the cold war, and put those megaEuro instead into international TV news and sports channels, says Andrea Borgnino, IW0HK (who works for Rai), in the *shortwave* yahooogroup. Pedro Sedano, Spain, of AER in *Noticias DX* says an Italian friend, apparently Borgnino, told him that Rai would close down its SW service before the end of July; RaiWay, the transmission provider, recently had a contract renewed but it did not mention SW.

Some other SW services are holding on: In Austria, the budget for ORF's radio services in 2008 will be cut by 2.5 million Euro. An ORF spokesperson denied rumors about 1.5 megaEuro of these savings to be made by stopping SW transmissions of Ö1 International: "This is

not a plan of the management at present," according to *Der Standard*, Austria, via Kai Ludwig.

Finland has been off SW but maybe not permanently: Juhani Niinisto in Ontario, formerly with YLE, tells *DX Listening Digest* that the Finnish government granted June 21 a broadcasting license for transmissions on SW and MW from Pori. The recipient is Digi Waves Oy (Ltd.), a subsidiary of Digita, Finland. Pori was built in the mid '80s by YLE. Since YLE discontinued its broadcasts from Pori, no one had been a license holder for any possible services from that station. YLE had no license requirement as its operations are governed by law. The granting of a license as such does not mean that some broadcasts would start immediately, or even later, or at all. It only makes it possible for the license holder (Digi Waves) to solicit for customers, and creates a legal basis for any broadcasts the license holder could be able to acquire.

**ALBANIA** Dear Radio Tirana Listeners, We are pleased to notify the first ever e-mail address of Radio Tirana English Section, as follows: radiotirana-english@hotmail.com You are kindly encouraged to make your comments, remarks and questions about Albania and everything Albanian via email. Thank you and all the best from sunny hot Tirana, (Drita Cico, ARTV-Head of Monitoring Center, RADIO TIRANA, *DX LISTENING DIGEST*)

**ARGENTINA** On 3385, 16 June at 2314, R. La Voz de las Madres, Buenos Aires, Spanish, tangos, local announcements, temp 5.2 degrees, ID // 530 kHz; signal was strong for a while, then fading, the cycle repeating; during fades heard what sounded like a beacon WB (Renato Uliana, Brasil, @*atividade DX*) No other reports of this. Not an harmonic; maybe mixing product with the beacon, or someone relaying the 530 station, which has been legalized after many years of piracy/unofficialdom (gh)

Radio Continental heard on 11131-LSB at 1337 with program previews, *Carousel Mundial*.

R. Nacional Buenos Aires heard again on 6285 at 0031. I think this is a link to the studios, rather than a spur, since whenever it is on, it is carrying a remote broadcast, political event or football; and as soon as the remote is over it goes off while regular frequencies [6060] stay on the air.

Radio Baluarte reactivated 6215 with religion but not as strong as before; heard after sunset (Alfredo Locatelli, Uruguay, *ELeskuch@blog*) 6214.4, R. Baluarte, Puerto Iguazú, 2132-2150, Portuguese, Brazilian religious songs, 45333 - best signal ever this early (Carlos Gonçalves, Portugal, *BC-DX*)

**BELGIUM** RTBF International, 9970, fair in French at \*0300, then pop vocals in French; strength usually improving to good by 0330 (Jim Ronda, OK, *DXLD*) 9970 is one of those rare frequencies registered for only one station in the world at whatever time; different sources conflict on exact timespan, some as late as 2300. 9970 is also the only active SW frequency from Belgium itself (gh)

**BOLIVIA** New SW station! R. Universitaria on 4732 at 1110-1130 June 21 with pop music, but no location heard (Alfredo Locatelli, Uruguay, *condig list*) Also from 1050 with Argentine zamba music, no announcements (Arnaldo Slaen, Argentina, *ibid.*) At 2245-0015, several IDs, "97.9 MHz y ahora también onda corta 4730 kHz, Radio Universitaria, desde la ciudad de Cobiya, Universidad Amazónica de Pando"; Gives address radiouap@hotmail.com and Radio y Television Universitaria, Campus Universitario, Av. Las Palmas, Cobiya, Pando, Bolivia. More info at <http://www.uapnet.edu.bo> Announces SW schedule as 1000-1300, 2200-0200 the sign-off variable. Was relaying FM 97.9 but planned to have separate SW programming from July (Nicolás Eramo, Argentina, *DXLD*)

Audible but with heavy RTTY QRM before 0200 (Scott R. Barbour Jr., NH, *ibid.*) Free from QRM for 10 to 15 seconds at a time at 0058 (Maurits van Driessche, Belgium, *ibid.*) Good signal but heavy digital QRM here too until 0200\* (Alfredo Locatelli, Uruguay, *ELeskuch@blog*) No QRM in the morning, sign-on one day at 1015, another day \*0958, another \*1045 (Robert Wilkner, FL, *Japan Premium, SW Bulletin*) On July 1 stayed on until 0300\* with formal sign-off, university anthem, RTTY QRM (Rafael Rodriguez, Colombia,

*condig list*) From numerous reports, frequency varies slightly up to 30 Hz (gh)

R. Chicha, Toclá, Potosí, heard at 1050 on 4763, *Impacto* program, ID as "Radio Chicha, en 100.5 MHz FM para Toclá y onda corta de 4760 kilociclos para el mundo"; closed at 1115 (Alfredo Locatelli, Uruguay, *ELeskuch@blog*)

**BRAZIL** Rádio Educadora, de Limeira (SP), is the only Brazilian still on 120m, heard by Márcio Pontes, SP at 0917, with a sertaneja music show on 2380 kHz (Célio Romais, *Panorama, @atividade DX*)

**CHINA** [non] Does anyone know, mind or care about CRI's Cuban relay on 9570 12-14 UT effectively blocking Radio Australia on three of its frequencies?! When the Cuban comes on 9570, white noise appears on RA's 9580. A spur approx. 19 kHz from 9570 makes a mess of RA's 9560 and 9590. Matters get worse when modulation starts (Andy Reid, Ontario, *DXLD*) Someone apparently got the word, since 9570 was missing or sporadic for a few days, then came back with slightly better modulation and less spurious output, but still a problem in the east where the signal is aimed. In CNAm RA was received OK (gh)

**CHINA** PBS Yunnan, V. of Traffic, 6937, putting out spurs on 6905 S3, 6913 S3, 6921 S4, 6929 S5, 6937 S8 ute QRM, 6945 S4 with Chinese radar QRM, rather ironic that they are jamming themselves! 6961 S3 and finally 6969, so heard every 8 kHz from 6905 to 6969, with the fundamental under QRM. Heard at 1355 (Dave Vitek, South Australia, *harmonics yg*)

**CROATIA** [and non] Voice of Croatia English service don't actually broadcast about Croatia or the country's history and culture, etc. English broadcasts concentrate on local and international news, sports and the weather, but do have some music programs in the Croatian service with very few announcements between records (Richard Read, World DX Club *Contact*)

**CUBA** RHC fair-poor on 9820 in Spanish at 2240-2400\*. Annie Cora explained by e-mail that RHC is now using it for the irregular *Mesa Redonda Informativa* show at 2200 or 2230 until 2400, 100 kW aimed at CNAm, so Colombia is off the back (Yimber Gaviria, Cali, Colombia, *Noticias DX yg*) RHC used 9820 for years, but left it sometime last year. I was expecting them to resume it (gh)

**ECUADOR** HCJB had not used their 500 kW transmitter at Pifo for quite some years. But this HC-500 rig is back on air according to schedule, 2250-0230 to Brasil on 11920, running 250 kW. HCJB German service says no more broadcasts direct to Europe from Sept or Oct, and DRM tests will have to cease, but will continue with small antennas to South America until 2009, such as 3220 and 6080 kHz (Kai Ludwig, Germany, *DXLD*) Presumably were using one of those small 10 kW transmitters for the 4 kW DRM tests, but with high-gain antenna which must be dismantled for airport construction (gh)

**EGYPT** An espionage station plays music of the great singer Om Kalthoom, on 9450 heard at 0700-0800. Tarek Zeidan also reports it in the 7100-7200 range (Wolfgang Büschel, Germany, *DXLD*) This is station E25 to ENIGMA, also discovered hiding under Rai on 6140. Tarek says you can hear much

more of her music via [http://sawari.com/index\\_files/om-kalthoom.htm](http://sawari.com/index_files/om-kalthoom.htm) (gh)

**ETHIOPIA** [non] Another new clandestine started July 2, brokered by TDP, Zena Tewahedo the Ligament Holy Synod of the Ethiopian Orthodox Tewahedo Church in Exile, 1600-1700 on 15260 Mondays only in Amharic (Bernd Trutenau, Lithuania, *DXLD*) Via Samara, Russia,

*All times UTC; All frequencies kHz; \* before hr = sign on, \* after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; sesqui = one and a half; B-07=fall/winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

250 kW, 188 degrees (HFCC) Audio files at <http://www.eotcholy-synod.org/> (Dave Kernick, England, DXLD) On the second Monday, I heard this sign on at 1559 and off at 1700. First half sounded like a sermon; the second half a male voice with background music. Several frequency announcements were made, and at 1655 a postal address in California announced (Patrick Robic, Austria, WORLD OF RADIO)

Heard that on Monday, R. Freedom on Tuesday, Andenet Ledemocracy on Sunday (Kouji Hashimoto, Japan, Japan Premium) On Thursday during same hour heard EPPF Radio (Ernesto Paulero, Argentina, DXLD) Now every day of the week is accounted for on the 15260, 1600-1700 UT transmission, per TDP SW Airtime sked [www.airtime.be/schedule](http://www.airtime.be/schedule).

**html** Mon: Zena Tewahedo the Ligament Holy Synod of the Ethiopian Orthodox Tewahedo Church in Exile; Tue & Sat: Radio Xoriyo Ogadenia; Wed, Fri & Sun: Andenet Ledemocracy; Thu: EPPF Radio (gh)

**GREECE** 9935, RS Macedonias, Avlis, 9935, earlier reported with news in English M-F at 1156-1200, on at least two days in June instead at 1145-1200 relayed Deutsche Welle in Greek (Rumen Pankov, Bulgaria, Australian DX News)

**HUNGARY** As forecast last month, R. Budapest did terminate all foreign-language broadcasts at the end of June, but continued in Hungarian (gh) The following announcement was broadcast: "Now I would like to call your attention to the fact that as from June 30th 2007, Radio Budapest will cease to broadcast in English. Instead, Hungarian language broadcasts will be aired on our frequencies. This is part of changing the program structure of Hungarian public radio in order to have a more cost-effective operation. Thank you for having listened to us." (Media Network blog)

Disappointed with final broadcast. Hoped for more about R. Budapest, their broadcasting history, etc., in other words a "proper" goodbye. I guess I need closure. I will miss R. Budapest. Interesting programming not heard elsewhere. Was an RB SW Club member for many years (Kraig Krist, VA, DXLD) Another sad closure; I've been listening to Radio Budapest nearly 45 years. When I roam the bands and notice such cornerstone stations missing, it's the same feeling as when I revisit the neighborhoods in which I grew up and all the familiar places are gone (Al Quaglieri, NY, NASWA Listeners Notebook)

R. Budapest continues to produce a 58-minute program in Hungarian, *Szülföldünk* ("Our Birthland"/"Our Homeland") repeated over and over, at 18-23 to Europe; and to NAM at 00-01 on 6195, 0130-0230 on 6140. Also plays Hungarian music, and relays domestic Kossuth Radio for many hours (Dragan Lekic, Serbia, DXLD)

Looks very much like merely killing airtime, since the amount of transmitter hours appears to be about the same as before. I can hardly imagine that this is intended by MR but strongly suspect that they just cannot get rid of all the airtime agreed with Antenna Hungária (the transmitter operator) at present. So all they saved so far by axing the foreign language broadcasts are the royalties/salaries of the now fired editors. Congrats! (Kai Ludwig, ibid.)

We are aware of the fact that our decision is painful to many people. It was not easy to come to this conclusion, as Radio Budapest broadcast news about Hungary and served many of you through many years. Thank you for your continuous and honorable attention. We hope that our programs were worthy of your interest. In hoping for your kind understanding! Yours sincerely, György Such, President of the Hungarian Radio (via Kraig Krist, WORLD OF RADIO)

**ICELAND** In the June 28 evening news, Ríkisútvarpið reported the end of shortwave broadcasts to be July 1 (Reynir H. Stefánsson, Iceland, DXLD) And no longer heard as of July 1 (Harry Brooks, NE England, ibid.) So cross off their schedules on 13865 and 12115-USB (gh) Modulation was awful (Walt Salmani, Poland, DXLD) These were never intended for the public, but ships at sea (Trutenau, ibid.)

**INDONESIA** VOI heard on 9525 in Korean instead of Indonesian at 1300-1400; Korean had been at 1200 (gh) VOI expanded Thai and Japanese programs from 30 minutes to an hour, some days on 9525, others on 11785, bumping other languages later: 1000 Thai, 1100 Chinese, 1200 Japanese, 1300 Korean, 1400-1500 Indonesian (A. Ishida via S. Hasegawa, NDXC)

Atsunori Ishida updates an Indonesian monitoring list every few weeks: <http://wave.ap.teacup.com/applet/n1hp/msgcate2/archive> He was hearing RRI Biak again on 4920 at \*2000 and until 1500\* (via S. Hasegawa, NDXC)

**ISRAEL** In early July, more Israel Radio cutbacks were rumored, as of August 1, severely curtailing foreign languages, including the only external English broadcast at 1900. Also, they say that shortwave is due to end on the 1st of January 2008. Employee reductions were mentioned. Always subject to negotiation (Doni Rosenzweig, DXLD)

Judging from several monitoring reports by José Miguel Romero, Wolfgang Büschel and Terry Krueger, one can never be sure whether Galei Zahal, the IDF station, will be on one or both of its frequencies, or neither, and if on may vary up to 10 kHz away from 6973 and 15785 (gh)

**KOREA NORTH** The VOK transmitter for Europe on nominal 15245 varies and puts out variable spurs around 15185.26 and 15304.89 between 1300 and 1950, including English at 1300, 1500 and 1800 (Wolfgang Büschel, Germany, DXLD)

[non] The new Japanese-government-sponsored abductee service for North Korea mentioned last month is *Radio Furusato no Kaze* = Wind of Hometown, launched July 9, per Kyodo News (S. Hasegawa, NDXC) 30 minutes each in Korean and Japanese, repeated daily for a week

before being updated. The Cabinet Office said it was not releasing time or frequency in order to avoid jamming by North Korea (AP via Mike Cooper, DXLD) 1600-1630 Japanese 9780, 1700-1730 Korean 9820 (WORLD OF RADIO) Both collide with other stations, but no jamming heard (Jari Savolainen, Finland, DXLD)

Radio Australia program was mistransmitted at end of *Furusato no Kaze* on July 11 for a short time; site may be Tainan, Taiwan (S. Hasegawa, NDXC) Whence RA is also relayed. If you're trying to operate in deep secrecy, better not make mistakes like that (gh) Tainan, Taiwan, 9780 with 250 kW at 45 degrees, 9820 with 100 kW at 2 degrees (Ivo Ivanov, R. Bulgaria, DXLD) 9780 fair to good here, no jamming or QRM at all (Ron Howard, CA, ibid.) Address: Furusato no Kaze, Headquarters for the Abduction Issue, 1-6-1, Nagata-cho, Chiyoda-ku, Tokyo 100-8968, Japan Email: [info@rachi.go.jp](mailto:info@rachi.go.jp) (S. Hasegawa, NDXC) In Korean, name of station is *Ilpone Palam* (Wind of Japan), different from Japanese (Takahito Akabayashi, Japan, BC-DX)

KWHR calls it "Korean Cultural Programming," M-F at 1100-1158 on 9930, but it's really the clandestine, Open Radio for North Korea, as mentioned last month. No jamming audible here, and heard at 1127-1135 alternating English and Korean with complete two-year-old news items in each language. Well, they are a bit behind in North Korea, but why in English first? Closes with a *Pomp & Circumstance* march (gh)

**KURDISTAN** [non] Denge Mezopotamya extended schedule to 0400-2000 on 11530 (TDP via Bernd Trutenau, Lithuania, DXLD) in Kurdish via Kishinev, Moldova, 300 kW, 116 degrees daily (DX Mix News, Bulgaria)

**KUWAIT** R. Kuwait in English on 11990, heard June 28 at 1945 with pop music, 2000 ID, reactivated? (Tony Rogers, UK, BDXC-UK) Also with news at 1830 (Steve Lare, MI, DXLD) At 1800-2100 as previously. Morning transmission in English to S Asia on 15110 has also resumed at 0500-0800 (Noel R. Green, England, DXLD) English had been off SW for 3 or 4 years. It's great to hear something back on SW especially with the closure of Radio Budapest and Iceland's SW relays (Dave Kenny, England, BDXC-UK)

unID in Arabic on 9885 between 2120 and 2303 (José Miguel Romero, Spain, DXLD) Maybe Kuwait, error, supposed to be on 9855 at 1810-2400 per Aoki (gh) Yes, seems to be Kuwait (Tomás Méndez, Spain, playdx yg) Next day on 9855, not 9885 (Romero, DXLD)

**LAOS** [non] KWHR Hawaii schedule shows more Hmong shows at 1200-1300 on 12130: Tue & Thu, *Hmong World Christian Radio*; Fri *Radio Hmong Radio* [sic], separate from *Hmong Lao Radio* on WHRI (gh)

Vang Pao, Hmong leader in exile, and nine others were arrested in California in early June, for a plot to smuggle arms from Thailand into Laos and overthrow the Laotian government (Minneapolis Star-Tribune) This was a hot topic on *Hmong Lao Radio* for weeks to come, with which Vang Pao may have connections, judging from English names and words mixed in with the Hmong, Sat & Sun 1300-1400 on 11785 via WHRI (gh)

**LIBERIA** Radio Veritas, 5470 in mid July at 2049-2104\*, animated political discussion in English, terse ID at 2104 before pulling the plug, not until 2300\* as in *WRTH* (Chris Lobdell, MA, NASWA Flashsheet)

[non] Heard announcement on Star Radio that it would be temporarily closed from June 15 to relocate offices and studios from the Old CID Road in Mamba Point to 12 Broad Street, opposite Ruby Bar and Restaurant, Snapper Hill in Monrovia. Listeners were assured that it would resume broadcasting in the shortest time possible. 9525, 0700-0800 via Ascension (Stig Hartvig Nielsen, Denmark, DXLD) Same info on the website, not being updated because of the move (Media Network blog) Had been sharing the hour with Cotton Tree News, for Sierra Leone in second half, but then CTN heard during the first half too (Bjarke Vestesen, Denmark, DSWCI DX Window)

**LIBYA** [non?] Tuned in new 15550 at 1205 July 4 to hear news in English just ending with ID for V. of Africa from the Great Jamahiriyyah, 1206 into French, 1212 music. Audio was good; fair signal with deep fades. Hard to decide if this were direct or via France. English news must have started close to 1200; later interference from Russia already using 15550 (gh, OK)

**LITHUANIA** The Mighty KBC, based in Netherlands, announced new weekly programs on 6255: Fri & Sat 2200-2259 at 259 degrees, UT Sun 0100-0159 at 310 degrees; expects to become daily in 2008. [www.kbcradio.eu](http://www.kbcradio.eu) (Ydun Ritz, Denmark, DXLD) The 310 degree broadcast must be for NAM (gh)

**MADAGASCAR** World Christian Broadcasting is building a SW station here, Madagascar World Voice, to counterbalance its KNLS in Alaska. The *Dallas Morning News* (via Mike Terry) reported that Rep. Pete Sessions, R-Dallas, wants U.S. taxpayers to spend \$2.5 million on it, prompted by U.S. Ambassador to Madagascar, James McGee, the excuse being that it is helping fight HIV/AIDS in Africa – even though it's not on the air yet. Another blatant violation of church and state if it were to happen, and WCB is not even a constituent of Sessions, but based in Tennessee (gh)

**MÉXICO** After missing a few weeks, Radio UNAM was barely audible again from July 8 on 9599.2 variable, better at 0135 than at 1310. Blocked by Cuba at times such as before 1300 (gh, OK) It's weak even here in the DF, // 860 with classical and cultural programming (Julian Santiago Diez de Bonilla, WORLD OF RADIO)

**NETHERLANDS** Former RNW commentator Rob Greene has launched his own blog, <http://insite2out.wordpress.com>

RNW itself also has a new blog connected with a series of global debates entitled "Who Can We Trust?" organized by former RNW PD Jonathan Marks, <http://blogs.rnw.nl/rnw60debates/> (Andy Sen-



nitt, *Media Network* blog)

**PAPUA NEW GUINEA** Three stations audible around PNG sunset 0735-0840, all presumed, with Pidgin talk, occasional music: 3260 R. Madang, 3315 R. Manus, 3335 R. East Sepik. Best multi-station PNG logging at this QTH this summer (Stephen Bass, OH, *DXLD*)

**PERU** 4954, R. Cultural Amata, 2210, Asian style music with announcers in presumed Japanese; signal was strong but suffered from modulation problems, mentions of Jesucristo (Steve Wood vacationing in Lima, Peru, *CIDX Messenger*)

4940, R. San Antonio, Villa Atalaya, 0120 with mass, 0133 ID mentioning 95.5 FM and 4940, cut off without closing at 0201.

5120.4, R. Ondas del Suroriente, Quillabamba, 0035-0106, *Sábados Calientes* program, 0101 ID giving 1400, 96.5 and 5070 kHz (Rafael Rodríguez R., Colombia, *condig* list)

Shifted to 5120 probably to avoid WWCR! On 4940, don't confuse with the sporadic Venezuelan, q.v. (gh)

**POLAND** [and non] R. Racja, for Belarus, added a broadcast via Lithuania, 100 kW, 1530-1730 on 6225; also still transmitted via Warsaw at 1930-2130 on 6105 (Bernad Trutenau, Lithuania, *WORLD OF RADIO*) 6105 broadcast is now the only transmission from Poland on SW; transmitter already on with characteristic rumbling sound at 1925, 1930 R. Racja ID, stronger at 2100 recheck (Mike Barraclough, England, *WDXC Contact*) Polish Radio now only transmitted from Germany (gh)

**ROMANIA** RRI transmissions are disrupted due to reconstruction of SW facilities. According to the DX-editor of RRI in Russian: 1) All antennas will be repaired by at least May 2008. 2) All transmitters will be replaced with six new ones: 3 x 300 kW in Tiganesti, 2 x 300 kW in Galbeni and 1 x 100 kW in Saffica. 3) Until Sept 15 there will be problems in Galbeni with Romanian, English and French broadcasts. 4) From Sept 15 till Oct 30, Tiganesti work causes Russian and Chinese to be only on Internet. 5) Saffica work should be finished by May 2008 or earlier. For season B-07 all broadcasts will be on the air as usual (Rumen Pankov, Bulgaria, *BC-DX*)

**SRI LANKA** SLBC presenter Roshan Abhiseka mentioned that the refurbished 9770 transmitter used for English programming is now running at 200 kW and that evening transmissions in English are to resume from B07 (David Woollan, Nepal, *DXLD*) 9770 sked: 0100-0430 (Sun -0515) (*WRTH*)

**SUDAN** [non] Southern Sudan Interactive Radio Instruction, all in English:

0600-0630 M-F, 15440 Dhabbaya, UAE, 250 kW, 240 degrees

0600-0630 M-F, 15505 Armavir, Russia, 500 kW, 188 degrees

0630-0700 M-F, 11945 Kigali, Rwanda, 250 kW, 15 degrees

0630-0700 M/W/F, 15445 Dhabbaya, UAE, 250 kW, 240°

1400-1430 Tue/Thu/Sat, 15470 Armavir, Russia, 200 kW, 188°

(*DX Mix News*, Bulgaria)

Although Sudan Radio Service still has no SW frequency sked on its website, [www.sudanradio.org/index.php](http://www.sudanradio.org/index.php) the Time Table page in UT +3 indicates there are more English broadcasts than shown in the *WRTHA-07* update. Besides M-F 0300-0330 UT on 5985 via Kigali, and Sat/Sun 1500-1530 9840 via Moscow: namely, 0530-0600 M-F on 15325 via UAE; 1730-1800 M-F 9590 via UAE (gh)

**TAIWAN** New RTI address starting July 1: P O Box 123-199, Taipei, Taiwan, as announced on air and website (Ian Baxter, Australia, Alakesh Gupta, India, *DXLD*)

**TIBET** On 7385, China-Tibet Broadcasting Station *Holy Tibet* English program heard at shifted time 1635-1705 (Christer Brunström, Sweden, *SW Bulletin*) I met the producers of this program at the broadcasting complex in Lhasa and was the first foreign listener to visit them. *Holy Tibet* started in May 2001 and is now a full half-hour. New programs are produced on M/W/F with repeats on the following days. On Sundays there is only music. *HT* is aimed at tourists visiting Tibet as well as at the descendants of the many Tibetan refugees living in India (Maarten Van Delft, *DSWCI DX Window*) Also at 0700, both on several frequencies in the Tibetan-language service (gh)

**UKRAINE** Despite 100% increase of total RUI English hours in April, number of original program airings remained the same. In order to fill the air, number of repetitions has been doubled. My monthly DX program *The Whole World on the Radio Dial* is repeated 31 times! New *WWORD* edition does not abruptly replace the previous one. There is a curious alternation pattern: New show airs Sat 1918, Sun 0018, 0518, 1118, and previous show Sat 2118, Sun 0318, 0718, 1418 (Alexander Yegorov, RUI, *Signal*)

**U S A** From microphone to keyboard: On 6 July, *Talk to America* ended its 12-1/2 year run as VOA's live English-language radio talk show. From 11 July, it becomes an online live text chat, *T2A*, accessible via [www.voanews.com](http://www.voanews.com) once a week, Wednesdays at 1800 (*kimandrewelliott.com*) This is progress? What fills the 14-15 hour? (gh) Standard News Now fare, with *Reporters' Notebook* Friday at 1430-1500. I offered to revive *Communications World*, and it looked like it would happen, at that time, with repeats during the weekend, but ultimately that was not approved (Kim Andrew Elliott, *WORLD OF RADIO*)

Rumor of demise of the Delano site was premature. It'll stay on the air the next few years. VOA Greenville is not going to be on much longer than that, either (Charles A Taylor, WD4INP, Greenville, NC,

IRCA)

The House of Representatives approved an amendment by Congressman Connie Mack (R-FL-14) June 21 that will provide an accurate and comprehensive alternative source of news to the people of Venezuela. The amendment to the FY 2008 Foreign Operations Appropriations Bill, which passed by a voice vote, would grant the Broadcasting Board of Governors the tools to increase broadcasting to Venezuela and Latin America. On the House floor, Mack, a member of the House Foreign Affairs Committee, said "Freedom of the Press died in Venezuela on May 27, 2007, when Chávez shut down Radio Caracas Televisión (RCTV). . . We cannot turn our backs on the people of Venezuela. We must do more to promote freedom inside Venezuela." (Mack's website) VOA Spanish to LAm amounts to two sesquihours a day, and part of it in the morning is for the Andes, which includes Venezuela (gh)

This constitutes an escalation in the media campaign that Bush has unleashed against the Venezuelan revolution. Truth is winning and will keep winning this battle. Imperial lies against Venezuela will be defeated (Venezuelan Information Minister William Lara, via Bloomberg, via [kimandrewelliott.com](http://kimandrewelliott.com))

New exile program started abruptly in July on WRMI, *La Voz de la Demajagua*, Sun 2230-2300 on 9955, from the Association of Cuban Cattleman (*Ganaderos*) in Exile (Jeff White, WRMI) *Demajagua* is an historic farm in Granma, now also the name of the Communist Party newspaper there. This displaced *Mundo Radial* and *World Cricket Today* to UT Monday 0500-0530 (gh)

The schedules for KJES in most references, including ours (*MT's*) through August, missed the fact that KJES shifts all broadcasts one UT hour earlier during DST, including English at 1300-1500 on 11715, 1800-1900 on 15385, 0100-0230 on 7555. Even the FCC has it wrong, so it could be that KJES is making the shifts without authorization, going by the local clock instead of UT (gh)

A Colleton County jury found that minister Ralph G. Stair and his Overcomer Ministries misled 11 former members concerning how their donations were to be used. If a planned appeal fails, the verdict will cost Stair \$731,679.64. The jury unanimously awarded the plaintiffs \$274,163 in actual damages and charged Stair another \$457,516.64 in punitive damages. "Every single one of them is a liar," said Stair when asked about the verdict. "It's all in the Lord's hands." Stair and his lawyer Mathias Chaplin plan to appeal the decision. The former members allege that they donated their money because they were told that it would only be used to fund Stair's internationally popular [sic] evangelical short-wave radio program. After leaving the church, the former members say, they realized that the money had been directed to other purposes, and filed suit in 2002 (Jared Goyette, *The Press and Standard*, South Carolina, April 27, 2007 via [www.rickcross.com/reference/rgstair/rgstair22.html](http://www.rickcross.com/reference/rgstair/rgstair22.html) via Mike Barraclough, *DXLD*)

[non] Brother Stair is being relayed by European pirate Laser Hot Hits on 6275. The Overcomer Ministry was heard on July 3 at 0905 on 6275 with a weak signal here although it was getting out better in mainland Europe. Stair has been announcing his new service on air. It is not daily (yet). Also heard Sunday July 1 on 6245 at 0920 – possibly being relayed by another pirate, Jolly Roger Radio in Ireland, which also carries Laser Hot Hits relays on Sunday mornings. It looks like Stair is now trying to convert free radio fans in Europe (Paul Watson, England, *DXLD*)

**VANUATU** Radio Vanuatu (assumed), reactivated in mid-July on 3945, no ID at 1000 but into obvious Sunday church Vanuatu style program. Always great a cappella music here. Pretty clear, fairly steady signal, moderate strength (David Norcross, Hawaii, *DXLD*) Watch out for Japan on 3945 until 0730 weekdays, 0930 Sat, 0900 Sun (gh)

**VENEZUELA** Formerly jumping around above 5.1 MHz with a distorted signal, in late June, R. Amazonas, Puerto Ayacucho, the only active SWBC station in the country, was widely reported near its nominal 4940 (gh) 4939.6, ex 5125v at 2228 but closing very early at 2330\* (Rafael Rodríguez R., Colombia, *condig* list) Another day on 4939.82, presumed R. Amazonas, 0019-0037 but IDs too soft to make out (Scott R. Barbour, Jr., NH, *DXLD*)

[non] R. Nacional de Venezuela replied to my report in 13 months, via FedEx direct from Caracas costing \$40 US, with a lot of literature in Spanish like *Empresas de Producción Social*, *La Pobreza de Venezuela*, and *Obras del Gobierno Bolivariano* (Dan Malloy, Canada, *ODXA*)

**ZANZIBAR** On one occasion in mid-June Voice of Tanzania Zanzibar heard on 11735 with news in English from Spice FM at 1800 instead of 1800 (Christer Brunström, Sweden via Thomas Nilsson, *DXLD*)

**ZIMBABWE** Mugabe's Voice of Zimbabwe was still running nothing but music tests in mid-July. Some possible reasons: ZBH's Spot FM Editor-in-Chief Methuseli Moyo faced dismissal for resisting deployment to the new state-run radio station, VOZ. Sources said Moyo rejected an appointment at the controversial station arguing that he was a professional journalist and not a propagandist.

A later story said that radio jamming equipment from China was gagging the VOZ project, due to "self-signal interception," whatever that means (Zim *Independent* via David Pringle-Wood, *DXLD*)

Until the Next, Best of DX and 73 de Glenn!

# BROADCAST LOGS

NOTEWORTHY LOGS FROM OUR READERS

Gayle Van Horn, W4GVH

gaylevanhorn@monitoringtimes.com

http://mt-shortwave.blogspot.com

## 0036 UTC on 4716.62

BOLIVIA: Radio Yura. Announcer's Spanish text to station identification at 0143. Fair signal amid static crashes. (Scott Barbour, Intervale, NH) Additional Bolivian stations in Spanish: Radio Mosoj Chaski 3310 ,0052-0111 (Barbour) Radio Santa Cruz 6134.8, 0935-1005 (Brian Alexander, PA; Chuck Bolland, Clewiston, FL) Radio Panamericana 6105.56, 1116-1120. (Arnaldo Slaen, Buenos Aires, Argentina)

## 0045 UTC on 4918.98

ECUADOR: Radio Quito. Spanish slogan "la voz de la Capital." Ads, jingles and announcer's talk. Spanish pop music with good signal strength but slight CODAR interference and adjacent channel splatter. (Alexander) HCJB Global 11960, 1732-1742 English religious text to inspirational music and sermon. La Voz del Napo 3279, 1007 Spanish prayers. (Joe Wood, Greenback, TN)

## 0240 UTC on 15630

GREECE: Voice of Greece. Greek folk music program // 7475. (Stewart Mac Kenzie, Huntington Beach, CA) Spanish comedy interludes, sports and interviews. (Branco. NY)

## 0351 UTC on 4885

BRAZIL: Radio Clube do Para. Portuguese station promos in echo-effect. Station IDs and program items to up-tempo Braz music. (Wood) Additional Brazilians in Portuguese: Radio Record (tent) 6150, 0232-0238 (Barbour) Radio Nacional 3375, 0851-0904 (Harold Frodge, Midland, MI) Radio Aparacida 5035, 0910-0920; Radio Senado 5990, 0955-1010 (Alexander) Radio Cultura Ondas Tropicais 4845.27, 1014-1025. Radio Central Brasileira De Anhanguera 4915, 1003-1020. (Bolland).

## 0503 UTC on 7240

SOUTH AFRICA: Channel Africa. Good signal for program on AIDS treatments for African children. (Wood) 17770 at 1515 with Africa Power Hour. (Branco)

## 0529 UTC on 5030.01

BURKINA FASO: Radio Burkina. Station sign-on with instrumental national anthem. Opening French ID and station info at 0530. Local tribal style music to French announcement breaks. Fair signal for Burkina in the clear tonight, with Costa Rica 5030 off the air. Slight splatter via Cuba on 5025. (Alexander)

## 0848 UTC on 5939.30

PERU: Radio Melodia. Signal under a Brazilian station on 5940. Spanish comments as signal faded periodically, and reappeared to poor level. Peruvians in Spanish: Radio Cuzco (tent) 6193.40, 0910-0915; Radio Ancash 4990.91, 1027-1038; (Bolland) Radio Tawantinsuyo 6173.79, 1055-1100. (Slaen) Radio Victoria 6019.52, 0615-0635 (Alexander) Radio Sicuani 4826.37, 0952-1005. (Bolland).

## 0855 UTC on 5920

RUSSIA: Radio Rossii (tentative). Weak signal under WBOH. Time ticks to Russian news and comments. Overall poor copy possibly via Petropavlovsk-Kamchatskiy. (Bolland) Voice of Russia 15425, 0220-0225. Weak signal on // 5900; Vatican Radio via Russia 15560, 0207-0215. (Jim Evans, Germantown, TN) Additional Voice of Russia 9405, 1630; 7350, 1636; 9435, 0304; 13970, 1617; 6145, 1618; 12085, 1620; 12025, 1621; 11540, 1622; 9930, 1624. (Gerry Brookman, Kenai, AK)

## 0952 UTC on 4749.96

INDONESIA: RRI Makassar. Indonesian. Fair at best with sub-continental vocals and lady's announcement. Additional Indo's: RRI Manokwari 3987.04, 1150-1217; RRI via Cimanggis 9524.97, 1159-1222.; RRI Fak Fak 4789.98, 1304-1315. (John Wilkins, Wheat Ridge, CO) Voice of Indonesia 9525, 1025-1030; RRI Jakarta 9680, 1035-1110; RRI Wamena 4869.91, 1035-1045. (Bolland)

## 1003 UTC on 9615

PHILIPPINES: Radio Veritas Asia. Mandarin. Language comments to music presentation for fair signal. FEBC-Philippine relay 6193.31, 1025-1030. Faint signal for Mandarin service and religious music. (Bolland).

## 1104 UTC on 9930

CLANDESTINE: Open Radio for North Korea (ORNK) via KWHR. Korean text over classical music and ballads. Segments of US soul music by Otis Redding to 1158. Pomp and Circumstance to English ID. Fair-good signal quality with no jamming observed.

(Ron Howard, Monterrey, CA) Additional stations: Cotton Tree News 9525, 0735-0759; SW Africa 12035, 1708-1714. (Slaen) Shiokaze via Taiwan 9485, \*1300-1330.\* Chinese. Three-minute opening with piano background music. Reading roster of names, closing followed by usual Radio Free Chosun \*1330. Good signal amid nasty splatter. (Wilkins) Radio Xoriyo Ogadencia 15260, 1617-1627 (Slaen).

## 1112 UTC on 6214.27

ARGENTINA: Radio Baluarte. Portuguese. Reactivated station from Puerto Iguazu. SINPO 34343 during religious programming. Thanks to Nicolas Eramo for tip! (Slaen). Radio Continental 11440, 2254-2307. (Frodge)

## 1139 UTC on 6049.64

MALAYSIA: Asyik FM. Regional pop music program to 1200 news bulletin and "Asyik FM" identification. Good signal. Malaysia's Klasik Nasional 5964.92, 1215-1222. (Wilkins) Malaysia's RTM 6049.62, 1010-1030; RTM 6049.59, 1020-1030; RTM 7295, 1028-1045. (Bolland)

## 1542 UTC on 9740

SINGAPORE: BBC World Service relay. News program and discussion on U.S./Mexico border situation on aliens. SIO 444. Additional BBCWS monitored as: 9625, 0458; 13970, 2346; 15400, 2247; 1205, 2205; 6195, 1553; 5980, 1554; 5970, 1555. (Brookman)

## 1624 UTC on 9990

NORTH KOREA: Voice of Korea. Propaganda program on Japanese occupation of Korea to national music. Drama program on 13730 at 0235; 13970, 0412; 13760, 2246; 9990 at 1623. (Brookman) 9650, 1008-1015 Japanese. (Bolland)

## 1647 UTC on 11845

USA: Radio Marti. Spanish programming including IDs news on Cuba and segment on the music of Bob Dylan. Afternoon news roundup to Cuban salsa tunes. Station ID, frequency, meter band quote and move to 11930 kHz. (Gayle Van Horn, NC) Additional US stations: WRMI 9955, 1050-1100 Spanish program Aventura Diexista. SINPO 25432. (Slaen). WHRA 6145, 0535; WWRB 9385, 2155. (MacKenzie) AFN/AFRTS 12133 (Key West, FL) 2308-2330+. (Frodge) WINB 13570, 1747; WWCW 12160, 1744. (Wood)

## 1735 UTC on 11590

ISRAEL: Kol Israel. World news segments to ID. Focus on news from the Middle East to weather forecast and headline review. Trumpet blare to ID and end of English service. (Van Horn) 11590, \*0330-0340 English //9345 fair. Israel's Galei Zahal (tent.) 6971.16, 0057-0102. Hebrew text; 15780.05, 2151-2234 with slight freq drift. (Frodge).

## 2130 UTC on 11600

CZECH REPUBLIC: Radio Prague. Newscast to feature on 62<sup>nd</sup> Anniversary of VE Day. SIO 554. (Bob Fraser, Belfast, ME) Closing bits of Czech Book 11600, 2155-2157\*; 9415, 2230-2243. (Wood)

## 2148 UTC on 15205

RWANDA: Deutsche Welle relay. Program on searching for antiques in local flea markets, with focus on crockery styles. ID at 2152. (MacKenzie) World news, Business Report and Newslink on 15205 //11865, 2110-2130. (Van Horn)

## 2245 UTC on 4732.03

BOLIVIA: Radio Universitaria, Cobija, Pando. New station from Bolivia. Spanish. Musical program and several identifications and mention of "Universidad Amazonica de Pando, 97.9 MHz y ahora tambien onda corta 4730 kilohertz y en los 97.9 MHz frecuencia modulada transmite Radio Universitaria, desde la ciudad se Cobija...Universidad Amazonica de Pando...en la Radio Universitaria." Email given as radiouap@hotmail.com (Nicholas Eramo, Argentina/HCDX) Audible 1052-1108. SINPO 24332. (Slaen).

## 2306 UTC on 4828

ZIMBABWE: ZBC. Vernacular announcement to continuous Afro music with occasional .CODAR interference. Poor signal, but improving. (Barbour)

Thanks to our contributors – Have you sent in YOUR logs?  
Send to Gayle Van Horn, c/o Monitoring Times  
English broadcast unless otherwise noted.



# PROGRAMMING SPOTLIGHT

WHAT'S ON WHEN AND WHERE?

Fred Waterer

[fredwaterer@monitoringtimes.com](mailto:fredwaterer@monitoringtimes.com)

[www.doghousecharlie.com/radio](http://www.doghousecharlie.com/radio)

## Cruising on the Information Highway

**Y**ears ago, I would flip through the *World Radio TV Handbook*, and look at all the listings for domestic broadcasters in far flung parts of the world, often wishing I could hear them. I also realized it was improbable that I ever would.

There were occasional exceptions. The odd time, I would hook up with a pen pal, who would exchange tapes with me. Short of taking some dream trip around the world, this was the only way I was going to hear far-flung local stations. It was fun to be able to hear East and West German, Dutch and Soviet local stations, or the famous offshore pirate stations, or even west coast stations from North America. Often, my trading partner would question why I would be interested in boring local radio stations. I would be similarly incredulous when they loved my recordings of what I considered less than interesting, commercial-laden programming from here.

The common denominator was that it was programming that neither of us could normally hear.

And then along came the internet.

Suddenly everything changed, and with a few clicks one could hear radio stations from all around the world, many in close to CD quality. What an opportunity! I started referring to my computer as a powerful, world band radio, that also did some other neat stuff.

This month I'll take a look at this (relatively) new vista that has opened up to us. Summarizing all that's available in terms of radio on the internet in two pages is obviously impossible. There is so much variety that it boggles the mind. It all depends what you are interested in.

There are state broadcasters, who seem to be rushing headlong to embrace the internet as they cut back or abandon their shortwave broadcasts. Talk and music stations worldwide



have also embraced the internet, achieving a worldwide audience overnight. And there are an amazing number of individuals who have established their own stations or programs on the internet to fill a niche they feel is missing, with varying degrees of success and professionalism.

For the purpose of this column, we'll look at programming that was always out there, but inaccessible to all but local listeners.

### ❖ BBC World Service

The BBC World Service was once a station that one could listen to almost around the clock. There were usually a number of frequency choices, and hours and hours of quality programming. And then in recent years, the BBC decided that shortwave to North America was not a priority. Fair enough. So I checked out the BBCWS website, looking for listening options. The BBC solution is simple and straightforward. Buy a satellite radio. Or listen online.

I don't have a satellite radio. So the internet it is.

The beauty of the BBC World Service website is on demand listening. Virtually every program offered by the BBC is available for listening, at one's leisure, for 7 days following the broadcast. To quote those cheesy infomercials that run at 3am: "But wait! There's more!"

Thanks to the internet, it's not only World Service programming that is available on demand, but *all* BBC programming from all of their domestic networks as well.

Here's what I recommend. Play around with the BBC website. Check out the various networks and learn what there is to hear. Some BBC networks offer weekly email newsletters. Others just post upcoming programming to their websites.

I did one little tweak to the way the BBC website appears on my screen. It works for me. Figure out what works for you. When you first go to [www.bbc.co.uk/radio](http://www.bbc.co.uk/radio) look for the BBC logo near the top. Nearby it should give you the option of looking at the "UK Version" or the "International Version." I set my browser to show the UK version. This will make it easier

to find the many BBC domestic networks, as well as the World Service if you wish. The BBC website and player (accessible at the web page) also organize by program type across all networks. For instance, you can access all BBC comedy shows, or history, or jazz and so on.

Here's a quick survey of what you can find.

BBC 1, 1Xtra, 2, 3 and 6 are music oriented. BBC 1 focuses on "new music." 1Xtra is the home for "new black music" in Britain (their words, not mine). Radio 2 features everything from pop to oldies, big band to country. Radio 3 is the classical music channel. Toss in a sprinkling of Jazz. Radio 6 has a heavier sound. It's where you might find hard and classic rock, concerts and music documentaries.

Radio 4 features factual programs, or as the BBC puts it, Radio 4 is "the home of intelligent speech." For long-time World Service listeners, some old favorites reside here as well, such as **Just a Minute**, **Brain of Britain** and **From Our Own Correspondent**.

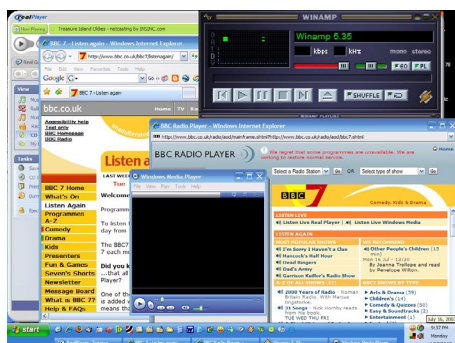
Radio 5 features live talk, sports and current affairs.

Radio 7 brings you classic comedy, drama, children's programming and classics of literature.

In addition, there are a multitude of regional and local services, Radio Scotland, Radio Wales, Radio Ulster and any number of stations in cities across Britain.

Some of my favorites include:

On Radio 2, Mark LaMarr's **God's Jukebox** show on Friday nights/Saturday mornings, "the best music of the past 70 years you never knew you liked." **Sounds of the Sixties**, hosted by Brian Matthew. Brian is considered by some the fifth Beatle – he hosted those cool BBC radio shows featuring the Beatles in 1962-63 before they became huge in North America – and is





heard Saturday mornings. **Malcolm Laycock** presents music of the big band era.

On Radio 3, I enjoy **Composer of the Week** with Donald McLeod. As the name implies, a different composer is featured each week, with an in-depth look at his/her life, career and music. Five one-hour shows each week. For Jazz fans, try **Jazz Library**, an occasional series, which may be back later in the year. Each Friday a different jazz performer is featured along with a discussion of their most important works.

Radio 4 highlights include current series such as **Brain of Britain**, **Just a Minute**, and **I'm Sorry I Haven't a Clue** (the self-proclaimed antidote to panel games, and, in my opinion, perhaps the funniest program on radio). Radio 4 also has some of the more interesting, in-depth programs and series.

Radio 6 is not my favorite BBC station; however, during the 3am hour, 7 days a week, **Radio 6 Plays it Again, Overnight**. Each night a different music documentary or episode of a music documentary series is aired.

Radio 7 is a real treasure. Classic comedy from **The Goon Show**, **I'm Sorry I'll Read That Again** (starring a young John Cleese), **Hancock's Half Hour** and **Beyond Our Ken** (featuring many of the cast of the "Carry On" films, including the unforgettable Kenneth Williams), and radio versions of BBC TV favorites like **Dad's Army**; **Yes, Minister**; and **To the Manor Born**. Radio 7 also features 7 hours a day of children's programming, daily dramatizations of works of literature, both modern and classic, and radio drama from soaps (**Westway**) to Sci-Fi to Thrillers.

One of the benefits of having so many BBC networks is the ability to air lengthy series. And I do mean lengthy. The overnight documentary slot on BBC 6 has aired a 52 part series on the history of Rock, as well as lengthy series on The Beatles, Elvis and any number of artists. Radio Ulster and Radio 7 have aired **A Short History of Ireland** (in 240 parts!), and Radio 7 has also aired a history of Britain and the Empire called **This Sceptred Isle**, which takes over a year to complete.

More recently there was a joint production between Radio 3 and 4 called **The Making of Music**. Each weekday, James Naughtie presented a 15 min program on Radio 4, discussing some aspect of the last 1000 years of music. After this program was over, one could switch to Radio 3 and hear an hour of music associated with that day's program. It's wonderful to have access, on demand, to this kind of in-depth programming.

## ❖ The Rest of the World

We've barely scratched the surface of domestic programming available on the internet. Elsewhere in the English-speaking world, the Australian Broadcasting Corporation, and Radio New Zealand both have national and regional

networks.

Programming from the ABC Networks is available online, including ABC Radio National, ABC Newsradio (which features a lot of BBC content) and three music channels including Triple J (new music), Classic FM (much like BBC Radio 3) and dig (Rock, Pop, Jazz, Country). Newsradio also broadcasts Parliament when it is in session. I listened to the debate about Australia's involvement in Iraq in 2003: interesting stuff. In addition, you can hear any ABC local radio broadcast. [www.abc.net.au/radio/](http://www.abc.net.au/radio/)

There are many private stations online in Australia, too. You can hear everything from music to talk, and let me tell you, Australian talk radio is a lot less tame than our own. Really. Try 3AW in Melbourne or 6PR in Perth. [www.mytalk.com.au](http://www.mytalk.com.au) will take you to both and more.

It's fascinating to listen to local radio from so far away. In some ways they face issues we can't imagine (yet?) such as drought in the Western Desert. In other ways, though, they discuss the same issues we do in North America. A few hours of Australian talk radio and you truly realize what a small world it is.

## ❖ New Zealand

"Radio New Zealand National is the station that keeps New Zealand informed and entertained. With its mix of news, current affairs, documentaries and features, drama and music it is the 'voice of New Zealand,' broadcasting programmes that reflect and develop our national identity.

"Radio New Zealand Concert is the fine music network broadcasting mainly classical music, plus specialist programmes covering jazz, contemporary and world music. 'Concert' features music news and interviews, and actively promotes New Zealand music and composition." [www.radionz.co.nz](http://www.radionz.co.nz)

## ❖ South Africa

A few years ago I had a friend in Cape Town. We were discussing our favorite stations at which time she gave me this link. [www.kfm.co.za/index.asp](http://www.kfm.co.za/index.asp)

K-FM is "the Cape's No. 1 music station." Give it a listen and, other than the accents of the DJs, you couldn't tell if this station was in Chicago, Toronto, London or Sydney. Just further evidence of the pervasiveness of Western music culture.

## ❖ Canada

CBC Radio One and Two are available online at [www.cbc.ca/local](http://www.cbc.ca/local). Pick a location and listen to the stream.

## ❖ Something a little different

Radio 101 in Moscow provides you with tens of music streams, featuring every possible



musical genre. When I first heard this station, it had a couple of wobbly streams. Now it has almost 40 channels, each offering a number of bit rates for every user from dial up to broadband. Get a taste of the incredible variety of the Russian musical scene today. [www.101.ru/](http://www.101.ru/)

Shortwave listeners may be familiar with Radio Medi 1. You can hear it online at [www.medi1.com/medi1/radio.php](http://www.medi1.com/medi1/radio.php)

In December, a coup in Fiji became very real to me by accessing a radio station there via the internet. As I mentioned on my website shortly after, "It was a bit surreal, one minute they were interviewing the Prime Minister who seemed for all intents and purposes powerless, then playing *Oh Little Town of Bethlehem* by Elvis or *Radio Gaga* by Queen... One DJ was reading the latest headlines he grabbed off the internet, from BBC and Google... Interesting radio indeed."

When events happen halfway around the world, you now have the opportunity to hear reportage as it happens, from the source. Don't neglect this opportunity.

Internet radio is a great tool to hear world-wide programming. Unless of course, rights' squabbles kill it off. In which case, drop me a postcard, we'll swap tapes.

## ❖ Updating a past column

Fred,

*I read your article in The July Monitoring Times about DX shows and wanted to let you know that RAE still broadcasts their DX show. The last time I heard it was in the spring, March I believe, and it was a Thursday night. I usually get pretty good reception of RAE here on Cape Cod throughout the year, especially in the summer. In fact I'm listening right now on 11710 @ 0215.*

73's, Steve Wood, South Yarmouth, MA

Enjoy the fall weather. Take care until the next edition of *Programming Spotlight*.

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# THE QSL REPORT

VERIFICATIONS RECEIVED BY OUR READERS

Gayle Van Horn, W4GVH

gaylevanhorn@monitoringtimes.com

## Get ready for MW season

Not only have shortwave radio conditions improved by September, but mediumwave DXers are getting ready for their prime listening and QSLing season, too.

Similar to shortwave, the reporting process begins with a basic reception report that includes the date, time (in the station's local time) frequency and program details. Information should include public service announcements, time checks, jingles, announcer names, commercials, or programming format.

Don't forget artist or song titles, but don't get bogged down with an extensive play-by-play description or word-for-word transcription over a long period of time. Sporting events usually include pre-game programming that includes interviews. Sport scores and game wrap-up shows are perfect for reporting.

Keep the reporting friendly and conversational. A brief explanation of the medium wave hobby and QSLing is a good idea for staff personnel who have no idea this is actually a hobby! Letters should be sent to the Program Director, General Manager or Chief Engineer. The latter should have an understanding of the hobby, and sometimes you find the engineer is an amateur radio operator or a hobbyist.

Many stations offer an email address, so check to see if the station has a web address. If not, you can locate a physical address by a Google search at **www.google.com**

If a follow-up report is needed in three or four months, keep it courteous and to the point. Good luck, as the medium wave stations begin rolling for the AM season, and don't forget to send in your QSL contributions.

### ALBANIA

Radio Tirana International, 13720 kHz. Partial data RTI card signed by Drita Cico-Head of Monitoring Center, plus souvenir postcard. Received in 12 days for an email report to [radiotirana-english@hotmail.com](mailto:radiotirana-english@hotmail.com). (Mick Delmage, Sherwood Park, Alberta, Canada). Website: **www.rtsh.com.al**. Address: External Service, Rruga Ismail Qemali Nr. 11, Tirana, Albania. (World QSL Book)

### AMATEUR RADIO

Guatemala TG9NX, 15 meters SSB. Full data two color cards. Received in 77 days for \$2.00 US to N4FKZ. Address: Francisco E. Capuano, 2500 SW 6<sup>th</sup> St., Apt. 501, Miami, FL 33135-2953 USA. (Larry Van Horn, NC)

Spain EA3NW, 12 meters SSB. Full data two-color card. Received in 462 days via ARRL bureau. (Van Horn)

### BRAZIL

Radio Clube do Pará 4885 kHz. Beautiful multi-colored photo card of Belém, signed by Camilo Centeno, plus English letter. Received in 31 days for a CD report and \$1.00 US. Station address: Almirante Barroso 2190, 3<sup>o</sup> andar, Marco CEP 66.093-020 Belém, Pará, Brazil. (Delmage)

### CLANDESTINE

Radio Saa 15180 kHz via Issoudin, France. Full data card with power, antenna and site noted. Received in 15 days for a CD mp3 report and prepared English/French QSL card (not used). QSL address: TDF-Radio Business Unit, Shortwave Department, 10, rue d'Oradour sur Glane, 75732 Paris, Cedex 15 France. (Ed Kusalik, Alberta, Canada) Station operates in opposition to Nigeria, and is brokered by TDP-Belgium. Website: **www.tdp.info/** Email: [info@transmitter.org](mailto:info@transmitter.org) (World QSL Book)

### DIEGO GARCIA

American Forces Radio 12759 kHz USB. Full data AFRTS logo card with site notation, signed by Robert Wilkner. Received in 15 days for an email report to [qsl@dodmedia.osd.mil](mailto:qsl@dodmedia.osd.mil) (Kusalik)

### MEDIUM WAVE

CHHA 1610 kHz AM. Full data prepared QSL card signed by Michelle Maron-Executive Director, plus personal letter on San Lorenzo Latin American Community Centre letterhead. Received in one month for an AM report and an SASE. Station address: SLLACC, 22 Wenderly Dr., Toronto, Ontario, Canada M6B 2N9. (Bill Wilkins, Springfield, MO)

CKDO 1580 kHz AM. Full data antenna site card signed by Shawn Smith. Received in 14 days for an AM report. Station address: 1200 Airport Blvd., Suite 207, Oshawa, Ontario, Canada L1J 8P5. (Delmage)

JOVG Hakodate 675 kHz. Full data QSL card unsigned, plus letter. Received for an AM report. Station address: 13-1 Chitosecho, Hakodate-shi, Hokkaido 040-8680 Japan. (Craig Edwards, Nhulunbuy, Northern Territory, Australia)

KMPH 840 kHz AM. Friendly letter with verification on station letterhead, signed by Jerry Moore-Chief Operator. Received in seven days for an AM follow up report to Chief Engineer. Station address: 1192 Norwegian Ave., Modesto, CA 95350 USA. (Patrick Martin, Seaside, OR)

KXLX 700 kHz AM. Full data verification letter signed by Bud Nameck-Program Director. Received in nine days for an AM report and a SASE. Station address: 500 West Boone Ave., Spokane, WA 99201-2497 USA. (Martin)

WTDY 1670 kHz AM. Partial data letter unsigned, plus station info sheet. Received in 23 months for two follow ups to Randy Hawke-Operations Manager. Station address: Mid-West Family Broadcasting, 730 Rayovac Dr., Madison, WI 53711 USA. (Jim Pogue, Memphis, TN)

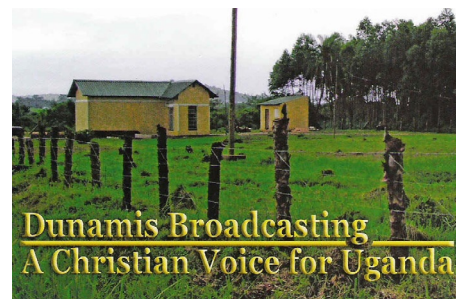
### PIRATE

Sunshine Radio 6925 kHz (via Grasscutter Radio). Verification sheet, plus fill-in sheet for Grasscutter Radio and photo QSL sheet of the Yeasu FT-757GX. Operator included a nice dual station CD of programming. Received in 12 days for a report to [grasscutter@yahoo.com](mailto:grasscutter@yahoo.com) (Kusalik)

WTCR 6925 kHz USB. Full data flying saucer QSL card, signed by Dr. Moribus. Received in 18 days for a pirate report and \$1.00 US. Maildrop: P.O. Box 1, Belfast, NY 14895 USA. (Dan Srebnick, Aberdeen, NJ)

### UGANDA

Radio Dunamis 4750 kHz. Full data color QSL card of transmitter site at Mukono, Uganda. Received for an email report to [dunamis4.750@hotmail.com](mailto:dunamis4.750@hotmail.com). QSL address: High Adventure Gospel Communications Ministries, HAGCM, P.O. Box 425, Station E, Toronto, Ontario, Canada M6H 4E3. Website: **www.biblevoice.org** (Jari Savolainen, Kuusankoski, Finland)



### USA

Checkerboard Lounge via WBCQ 7415 kHz. Full data *Special Edition* QSL card #1 of 100, signed by Roscoe the Bartender. Card is vintage photo of blues artist Hound Dog Taylor, Lefty Dizz and James Cotton. Received in nine days for an English report and an SASE. QSL address: The Checkerboard Lounge, 7914 Dodge Rd., Suite 210, Omaha, NE 68114 USA. Website: **www.wbcq.com/checkerboard**. (Gayle Van Horn, NC)

WPZS256 Newport, Oregon, 1650 kHz (10 watts). Verification letter, signed by Dan Prodzinski-ODOT Dispatch NWTOC. Received in three days. QSL address: ODOT Transportation Operations Center, 455 Airport Rd. SE, Bldg. B, Salem, OR 97301. USA. WPZS256 Coos Bay, Oregon. Verification received with WPZS256. Both stations share same call sign. (Martin)



## HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af  
 ③ ② ⑤ ③ ④ ⑥ ⑦

### Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Saving Time) 4, 5, 6 or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each hour.

Note that all **dates**, as well as times, are in UTC; for example, a show which might air at 0030 UTC **Sunday** will be heard on **Saturday** evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

### Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. English broadcasts are listed by UTC time on ①, then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not **daily**, the **days of broadcast** ⑤ will appear in the column following the time of broadcast, using the following codes:

Codes	
s/Sun	Sunday
m/Mon	Monday
t	Tuesday
w	Wednesday
h	Thursday
f	Friday
a/Sat	Saturday
occ:	occasional
DRM:	Digital Radio Mondiale
irreg	Irregular broadcasts
vl	Various languages

### Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports

from her monitoring team and MT readers to make the Shortwave Guide up-to-date as of one week before print deadline.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the **target area** ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

#### Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
ca:	Central America
do:	domestic broadcast
eu:	Europe
me:	Middle East
na:	North America
oc:	Oceania
pa:	Pacific
sa:	South America
va:	various

### MT MONITORING TEAM

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Frequency Manager

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## Thank You ...

### Additional Contributors to This Month's Shortwave Guide:

Rich D'Angelo/*NASWA Flash Sheet*; Rachel Baughn/MT; Alokesh Gupta, New Delhi, India; Anker Petersen/*DSWCI-DX Window*; Bernd Trutenau, Lithuania; Ivo Ivanov; Jose Jacob, India; Jose Miguel Romero; Adrian Sainsbury/R.NZ Intl; Tom Taylor, UK; Harold Sellers/*ODXA/DX Ontario*; Wolfgang Bueschel, Germany; Noel Green, UK; Daniel Sampson, WI; Andreas Volk, Germany; *BCL News*; *Cumbre DX*; *BDX Club*; *DX Mix News*, Bulgaria; *Hard Core DX*; *NASWA Journal/NASWA Flashsheet*; *World Wide DX Club-Top News*.

### Shortwave Broadcast Bands

kHz	Meters
2300-2495	120 meters (Note 1)
3200-3400	90 meters (Note 1)
3900-3950	75 meters (Regional band, used for broadcasting in Asia only)
3950-4000	75 meters (Regional band, used for broadcasting in Asia and Europe)
4750-4995	60 meters (Note 1)
5005-5060	60 meters (Note 1)
5730-5900	49 meter NIB (Note 2)
5900-5950	49 meter WARC-92 band (Note 3)
5950-6200	49 meters
6200-6295	49 meter NIB (Note 2)
6890-6990	41 meter NIB (Note 2)
7100-7300	41 meters (Regional band, not allocated for broadcasting in the western hemisphere) (Note 4)
7300-7350	41 meter WARC-92 band (Note 3)
7350-7600	41 meter NIB (Note 2)
9250-9400	31 meter NIB (Note 2)
9400-9500	31 meter WARC-92 band (Note 3)
9500-9900	31 meters
11500-11600	25 meter NIB (Note 2)
11600-11650	25 meter WARC-92 band (Note 3)
11650-12050	25 meters
12050-12100	25 meter WARC-92 band (Note 3)
12100-12600	25 meter NIB (Note 2)
13570-13600	22 meter WARC-92 band (Note 3)
13600-13800	22 meters
13800-13870	22 meter WARC-92 band (Note 3)
15030-15100	19 meter NIB (Note 2)
15100-15600	19 meters
15600-15800	19 meter WARC-92 band (Note 3)
17480-17550	17 meter WARC-92 band (Note 3)
17550-17900	17 meters
18900-19020	15 meter WARC-92 band (Note 3)
21450-21850	13 meters
25670-26100	11 meters

### Notes

- Note 1 Tropical bands, 120/90/60 meters are for broadcast use only in designated tropical areas of the world.
- Note 2 Broadcasters can use this frequency range on a (NIB) non-interference basis only.
- Note 3 WARC-92 bands are allocated officially for use by HF broadcasting stations in 2007.
- Note 4 WRC-03 update. After March 29, 2009, the spectrum from 7100-7200 kHz will no longer be available for broadcast purposes and will be turned over to amateur radio operations worldwide.

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# 0000 UTC - 8PM EDT / 7PM CDT / 5PM PDT

0000	0005	Greece, Voice of	7475eu	9420eu	15640eu
0000	0015	Japan, Radio Japan/NHK World			13650as
		17810as			
0000	0027	Czech Rep, Radio Prague	7345na	9440na	
0000	0030	Australia, HCJB Global	15525va		
0000	0030	Australia, Radio Australia	9660as	12080as	
		13670as	15240pa	17715as	17795va
0000	0030	Burma, Dem Voice of Burma	5955eu		
0000	0030	Egypt, Radio Cairo	9460na		
0000	0030	UK, BBC World Service	3915as	5970as	
		17615as			
0000	0030	USA, Voice of America	7555as		
0000	0045	India, All India Radio	9690as	9705as	
		11620as	11645as	13605as	
0000	0045	USA, WYFR/Family Radio FL	17805am		
0000	0056	Romania, Radio Romania Intl	9775na	11790na	
0000	0057	Canada, Radio Canada Intl	11700as		
0000	0058	Germany, Deutsche Welle	7245as	13730as	
		15595as			
0000	0059	Spain, Radio Exterior Espana	6055na		
0000	0100	Anguilla, University Network	6090am		
0000	0100	Australia, ABC NT Alice Springs		2310do	
		4835do			
0000	0100	Australia, ABC NT Katherine	5025do		
0000	0100	Australia, ABC NT Tennant Creek		4910do	
0000	0100	Canada, CFRX Toronto ON	6070na		
0000	0100	Canada, CFVP Calgary AB	6030na		
0000	0100	Canada, CKZN St John's NF	6160na		
0000	0100	Canada, CKZU Vancouver BC		6160na	
0000	0100	China, China Radio Intl	6020na	6075as	
		7180as	9570as	9725as	11885as
		13750as	15115as		
0000	0100	Costa Rica, University Network		5030va	
		6150va	7375va	9725va	
0000	0100	Guyana, Voice of	3291do		
0000	0100	Japan, Radio Japan/NHK World		6145na	
0000	0100	Malaysia, RTM/Trax FM	7295as		
0000	0100	Netherlands, Radio	9845na		
0000	0100	New Zealand, Radio NZ Intl	15720pa		
0000	0100	New Zealand, Radio NZ Intl	13730pa		
0000	0100	Papua New Guinea, Wantok R. Light		7325va	
0000	0100	Russia, Voice of	7250na	9665na	12755na
0000	0100	Singapore, MediaCorp Radio	6150do		
0000	0100	UK, BBC World Service	6195as	9580as	
		9740as	11955as	15335as	15360as
0000	0100	UK, Bible Voice BC		6140as	
0000	0100	Ukraine, Radio Ukraine Intl	7440eu		
0000	0100	USA, American Forces Radio	4319usb	5446usb	
		5765usb	6350usb	7811usb	10320usb
		12133usb	13362usb		
0000	0100	USA, KAIJ Dallas TX	5755va		
0000	0100	USA, KTBN Salt Lake City UT	7505na	15590na	
0000	0100	USA, WBCQ Monticello ME	9330am		
0000	0100	USA, WBOH Newport NC	5920am		
0000	0100	USA, WEWN Vandiver AL	5810na		
0000	0100	USA, WHRA Greenbush ME	7520na		
0000	0100	USA, WHRI Cypress Creek SC		7315am	
		7520am			
0000	0100	USA, WHRI Cypress Creek SC		9515am	
0000	0100	USA, WHRI Cypress Creek SC		7490am	
0000	0100	USA, WINB Red Lion PA	9265am		
0000	0100	USA, WRMI Miami FL	9955va		
0000	0100	USA, WTJC Newport NC	9370na		
0000	0100	USA, WWCN Nashville TN	5070na	7465na	
		13845na			
0000	0100	USA, WWRB Manchester TN	5745am		
0000	0100	USA, WWRB Manchester TN	3185va	5050va	
		6890na			
0000	0100	USA, WYFR/Family Radio FL	6065am	9595am	
		11835am			
0005	0100	Canada, Radio Canada Intl	6100na		
0030	0045	Germany, Pan American BC	6165as		
0030	0100	Australia, Radio Australia	9660as	12080as	
		13670as	15240pa	15415as	17715as
0030	0100	Lithuania, Radio Vilnius	11690na		
0030	0100	Thailand, Radio	5890na	9570af	
0030	0100	UK, Bible Voice BC	9620as		
0030	0100	USA, Voice of America	9715va	9780va	
		11725va	15185va	15205va	15290va
		15560va	17820va		
0035	0058	Sun/Mon	Austria, Radio Austria Intl	9870am	
0043	0058	twhfa	Austria, Radio Austria Intl	9870am	
0055	0100		Italy, RAI Italia	11800na	

# 0100 UTC - 9PM EDT / 8PM CDT / 6PM PDT

0100	0104	Canada, Radio Canada Intl	6100na
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0100	0115	Italy, RAI Italia	11800na		
0100	0127	Czech Rep, Radio Prague	6200na	7345na	
0100	0127	Slovakia, Radio Slovakia Int	5930na	9440sa	
0100	0200	Anguilla, University Network	6090am		
0100	0200	Australia, ABC NT Katherine	5025do		
0100	0200	Australia, ABC NT Tennant Creek		4910do	
0100	0200	Australia, Radio Australia	9660as	12080as	
		13670as	15240pa	15415as	17715as
		17750as	17775as	17795as	
0100	0200	Canada, CFRX Toronto ON	6070na		
0100	0200	Canada, CFVP Calgary AB	6030na		
0100	0200	Canada, CKZN St John's NF	6160na		
0100	0200	Canada, CKZU Vancouver BC		6160na	
0100	0200	China, China Radio Intl	6020na	9470eu	
		9535as	9570na	9580na	9725eu
		9790na	11870as	15115as	15785as
0100	0200	Costa Rica, University Network		5030va	
		6150va	7375va	9725va	
0100	0200	Cuba, Radio Havana	6000na	6180na	
0100	0200	Guyana, Voice of	3291do		
0100	0200	Indonesia, Voice of	9525as	11785pa	
		15150al			
0100	0200	Japan, Radio Japan/NHK World		5960va	
		11780as	11935na	15235as	15325as
		17560va	17685pa	17810as	17825va
0100	0200	Malaysia, RTM/Trax FM	7295as		
0100	0200	Netherlands, Radio	9845na		
0100	0200	New Zealand, Radio NZ Intl	15720pa		
0100	0200	New Zealand, Radio NZ Intl	13730pa		
0100	0200	North Korea, Voice of Korea	7140as	9345as	
		9730as	11735ca	13760ca	15180ca
0100	0200	Papua New Guinea, Wantok R. Light		7325va	
0100	0200	Russia, Voice of	7250na	9665na	12775na
0100	0200	Singapore, MediaCorp Radio	6150do		
0100	0200	Sri Lanka, SLBC	6005as	9770as	15745as
0100	0200	Taiwan, Radio Taiwan Intl	11875as	15465na	
0100	0200	UK, BBC World Service	6195as	9410as	
		9580as	11750as	11955as	15310as
		15335as	15360as		
0100	0200	UK, Bible Voice BC		6140as	
0100	0200	USA, American Forces Radio	4319usb	5446usb	
		5765usb	6350usb	7811usb	10320usb
		12133usb	13362usb		
0100	0200	USA, KAIJ Dallas TX	5755va		
0100	0200	USA, KTBN Salt Lake City UT	7505na		
0100	0200	USA, WBCQ Monticello ME	9330am		
0100	0200	USA, WBOH Newport NC	5920am		
0100	0200	USA, WEWN Vandiver AL	5810na		
0100	0200	USA, WHRA Greenbush ME	7520na		
0100	0200	USA, WHRI Cypress Creek SC		5850am	
		7315am	7490am		
0100	0200	USA, WINB Red Lion PA	9265am		
0100	0200	USA, WRMI Miami FL	9955va		
0100	0200	USA, WRMI Miami FL	7385na		
0100	0200	USA, WTJC Newport NC	9370na		
0100	0200	USA, WWCN Nashville TN	3215na	5070na	
		7465na	13845na		
0100	0200	USA, WWRB Manchester TN	5745am		
0100	0200	USA, WWRB Manchester TN	3185va	5050va	
		6890na			
0100	0200	USA, WYFR/Family Radio FL	6065am	9595am	
0100	0200	Uzbekistan, CVC International		11790as	
0105	0128	Sun/Mon	Austria, Radio Austria Intl	9870am	
0113	0128	twhfa	Austria, Radio Austria Intl	9870am	
0115	0130	Sat	Australia, HCJB Global	15405va	
0130	0200		Iran, Voice of the Islamic Rep	7235na	9495na
0130	0200		Sweden, Radio	6010na	11675va
0130	0200	twhfa	USA, Voice of America	6040am	13740am
0140	0200		Vatican City, Vatican Radio	5915va	7335va
0143	0158	twhfa	Austria, Radio Austria Intl	9870am	
0145	0200	twhf	Albania, Radio Tirana	6120eu	7425na

# 0200 UTC - 10PM EDT / 9PM CDT / 7PM PDT

0200	0215	Croatia, Croatian Radio	6165na	9925eu	
0200	0230	Iran, Voice of the Islamic Rep	7235na	9495na	
0200	0230	South Korea, KBS World Radio		15575sa	
0200	0245	USA, WYFR/Family Radio FL	11835na		
0200	0258	DRM	New Zealand, Radio NZ Intl	13730pa	
0200	0300		Anguilla, University Network	6090am	
0200	0300	twhfa	Argentina, RAE	11710am	
0200	0300		Australia, ABC NT Alice Springs	2310do	
			4835do		
0200	0300		Australia, ABC NT Katherine	5025do	

0200	0300	Australia, ABC NT Tennant Creek	4910do	
0200	0300	Australia, Radio Australia	9660as	12080as
		13670as	15240pa	15151as
		17750va	21725va	
0200	0300	Bulgaria, Radio	9700na	11700na
0200	0300	Canada, CFRX Toronto ON	6070na	
0200	0300	Canada, CFVP Calgary AB	6030na	
0200	0300	Canada, CKZN St John's NF	6160na	
0200	0300	Canada, CKZU Vancouver BC		6160na
0200	0300	China, China Radio Intl	11770as	13640as
0200	0300	Costa Rica, University Network		5030va
		6150va	7375va	9725va
0200	0300	Cuba, Radio Havana	6000na	6180na
0200	0300	Egypt, Radio Cairo	7270na	
0200	0300	Guyana, Voice of	3291do	
0200	0300	Malaysia, RTM/Trax FM	7295as	
0200	0300	Netherlands, Radio	9405va	
0200	0300	New Zealand, Radio NZ Intl	15720pa	
0200	0300	North Korea, Voice of Korea	13650as	15100as
0200	0300	Papua New Guinea, Wantok R. Light		7325va
0200	0300	Philippines, Radio Pilipinas	11880va	15285va
		15510va		
0200	0300	Russia, Voice of	9665na	9860na
		13775na		13635na
0200	0300	Singapore, MediaCorp Radio	6150do	
0200	0300	Sri Lanka, SLBC	6005as	9770as
0200	0300	Thailand, Radio	5890na	
0200	0300	UK, BBC World Service	6030af	6195as
		11750as	11955as	15310as
		15360as	17790as	15335as
0200	0300	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	10320usb
0200	0300	USA, KAIJ Dallas TX	5755va	
0200	0300	USA, KJES Vado NM	7555na	
0200	0300	USA, KJES Vado NM	7555na	
0200	0300	USA, KTBN Salt Lake City UT	7505na	
0200	0300	USA, KWHR Naalehu HI	17655as	
0200	0300	USA, WBCQ Monticello ME	5110am	7415na
		9330na		
0200	0300	USA, WBCQ Monticello ME	9330am	
0200	0300	USA, WBOH Newport NC	5920am	
0200	0300	USA, WEWN Vandiver AL	5810na	
0200	0300	USA, WHRA Greenbush ME	5890na	
0200	0300	USA, WHRI Cypress Creek SC		5850am
		7315am		
0200	0300	USA, WINB Red Lion PA	9265am	
0200	0300	USA, WRMI Miami FL	9955va	
0200	0300	USA, WRMI Miami FL	7385na	
0200	0300	USA, WTJC Newport NC	9370na	
0200	0300	USA, WWCR Nashville TN	3215na	5070na
		5935na		
0200	0300	USA, WWRB Manchester TN	5745am	
0200	0300	USA, WWRB Manchester TN	3185va	5050va
		6890na		
0200	0300	USA, WYFR/Family Radio FL	5985am	11855am
0200	0300	Uzbekistan, CVC International		11790as
0200	0300	Taiwan, Radio Taiwan Intl	5950na	9680am
0215	0230	Nepal, Radio	3230as	5005as
		7165as		6100as
0230	0300	Albania, Radio Tirana	6115eu	7425eu
0230	0300	South Korea, KBS World Radio		9560na
0230	0300	Sweden, Radio	6010na	
0245	0300	India, All India Radio	7420as	
0245	0300	Myanmar, Radio	9730do	
0250	0300	Vatican City, Vatican Radio	6040va	7305va
0255	0300	Rwanda, Radio	6055do	
0259	0300	New Zealand, Radio NZ Intl	11675pa	

## 0300 UTC - 11PM EDT / 10PM CDT / 8PM PDT

0300	0320	Vatican City, Vatican Radio	6040va	7305va
		15560va		
0300	0327	Czech Rep, Radio Prague	7345na	9870na
0300	0330	Egypt, Radio Cairo	7270na	
0300	0330	Myanmar, Radio	9730do	
0300	0330	Philippines, Radio Pilipinas	11880va	15285va
		15510va		
0300	0330	USA, KJES Vado NM	7555na	
0300	0330	USA, Voice of America	4930af	6080af
		7340af	9885af	12080af
0300	0330	USA, WBCQ Monticello ME	9330am	15580af
0300	0330	Vatican City, Vatican Radio	9660af	
0300	0355	South Africa, Channel Africa	5960af	
0300	0356	Romania, Radio Romania Intl	6150va	9645na
		11895va	15220va	
0300	0359	South Africa, Channel Africa	3345af	
0300	0400	Anguilla, University Network	6090am	
0300	0400	Australia, ABC NT Alice Springs		2310do

				4835do
0300	0400	Australia, ABC NT Katherine	5025do	
0300	0400	Australia, ABC NT Tennant Creek		4910do
0300	0400	Australia, Radio Australia	9660as	12080as
		13670as	15240pa	15151as
		17750va	21725va	
0300	0400	Canada, CBC NQ SW Service	9625na	
0300	0400	Canada, CFRX Toronto ON	6070na	
0300	0400	Canada, CFVP Calgary AB	6030na	
0300	0400	Canada, CKZN St John's NF	6160na	
0300	0400	Canada, CKZU Vancouver BC		6160na
0300	0400	China, China Radio Intl	9690na	9790na
		11770as	15110as	15120as
0300	0400	Costa Rica, University Network		5030va
		6150va	7375va	9725va
0300	0400	Cuba, Radio Havana	6000na	6180na
0300	0400	Germany, Deutsche Welle	11695as	13810as
0300	0400	Guyana, Voice of	3291do	
0300	0400	Japan, Radio Japan/NHK World		21610pa
0300	0400	Malaysia, RTM/Trax FM	7295as	
0300	0400	Malaysia, RTM/Voice of Malaysia		6175as
		9750as	15295as	
0300	0400	New Zealand, Radio NZ Intl	15720pa	
0300	0400	New Zealand, Radio NZ Intl	11675pa	
0300	0400	North Korea, Voice of Korea	7140as	9345as
		9730as		
0300	0400	Oman, Radio Oman	15355as	
0300	0400	Papua New Guinea, Wantok R. Light		7325va
0300	0400	Russia, Voice of	15735as	
0300	0400	Russia, Voice of	9435na	9515na
		9860na	9880na	12065na
0300	0400	Rwanda, Radio	6055do	
0300	0400	Singapore, MediaCorp Radio	6150do	
0300	0400	Sri Lanka, SLBC	6005as	9770as
0300	0400	Taiwan, Radio Taiwan Intl	5950am	15215sa
0300	0400	Turkey, Voice of	5975va	7270va
0300	0400	UK, BBC World Service	11760as	
0300	0400	UK, BBC World Service	3255af	6005af
		6030af	6190af	6195as
		12035af	15310as	15360as
		17760as		15575as
0300	0400	Ukraine, Radio Ukraine Intl	7440na	
0300	0400	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	10320usb
0300	0400	USA, KAIJ Dallas TX	5755va	
0300	0400	USA, KTBN Salt Lake City UT	7505na	
0300	0400	USA, KWHR Naalehu HI	17655as	
0300	0400	USA, WBCQ Monticello ME	5110am	7415na
0300	0400	USA, WBOH Newport NC	5920am	
0300	0400	USA, WEWN Vandiver AL	5810na	
0300	0400	USA, WHRA Greenbush ME	5890na	
0300	0400	USA, WHRI Cypress Creek SC		5835am
0300	0400	USA, WHRI Cypress Creek SC		5850am
		7490am		
0300	0400	USA, WHRI Cypress Creek SC		7315am
0300	0400	USA, WINB Red Lion PA	9265am	
0300	0400	USA, WRMI Miami FL	9955va	
0300	0400	USA, WTJC Newport NC	9370na	
0300	0400	USA, WWCR Nashville TN	3215na	5070na
		5935na	7465na	
0300	0400	USA, WWRB Manchester TN	3185va	5050va
0300	0400	USA, WYFR/Family Radio FL	6065na	9505na
		11740na	15255na	
0300	0400	Uzbekistan, CVC International		13680as
0330	0335	Bahrain, Radio Bahrain	6010as	
0330	0345	Israel, Kol Israel	9345eu	11590va
0330	0355	Vietnam, Voice of	6175na	
0330	0357	Czech Rep, Radio Prague	6080as	9445as
		11600as		
0330	0400	UK, BBC World Service	15420af	
0330	0400	USA, Voice of America	4930af	6080af
		9885af	12080af	15580af
0330	0400	USA, WBCQ Monticello ME	9330am	

## 0400 UTC - 12AM EDT / 11PM CDT / 9PM PDT

0400	0430	Australia, Radio Australia	9660as	12080as
		13670as	15240pa	15151as
		17750va		
0400	0430	France, Radio France Intl	9805af	11995af
0400	0430	Sri Lanka, SLBC	6005as	9770as
0400	0430	USA, WWRB Manchester TN	5745am	
0400	0445	USA, WYFR/Family Radio FL	6065na	9505na
0400	0458	New Zealand, Radio NZ Intl	15720pa	
0400	0458	New Zealand, Radio NZ Intl	11675pa	
0400	0500	Anguilla, University Network	6090am	
0400	0500	Armenia, CVC International	15515as	
0400	0500	Australia, ABC NT Alice Springs		2310do
		4835do		



0400	0500		Australia, ABC NT Katherine	5025do	
0400	0500		Australia, ABC NT Tennant Creek	4910do	
0400	0500	twhf	Canada, CBC NQ SW Service	9625na	
0400	0500		Canada, CFRX Toronto ON	6070na	
0400	0500		Canada, CKZN St John's NF	6160na	
0400	0500		Canada, CKZU Vancouver BC	6160na	
0400	0500		China, China Radio Intl	6020na	6080as
			13750as	15120as	15785as
			17855as		17725as
0400	0500		Costa Rica, University Network	5030va	
			6150va	7375va	9725va
0400	0500		Cuba, Radio Havana	6000na	6180na
0400	0500		Germany, Deutsche Welle	7225af	7245af
			12045af	15445af	
0400	0500		Guyana, Voice of 3291do		
0400	0500		Malaysia, RTM/Trax FM	7295as	
0400	0500		Malaysia, RTM/Voice of Malaysia	6175as	
			9750as	15295as	
0400	0500		Netherlands, Radio	6165na	
0400	0500	vl	Papua New Guinea, Wantok R. Light	7325va	
0400	0500		Russia, Voice of	9435na	9515na
			9880na	13635na	13775na
0400	0500	DRM	Russia, Voice of	15735as	
0400	0500	vl	Rwanda, Radio	6055do	
0400	0500		Singapore, MediaCorp Radio	6150do	
0400	0500	vl	Uganda, Radio	4976do	5026do
0400	0500	DRM	UK, BBC World Service	7440eu	
0400	0500		UK, BBC World Service	3255af	6005af
			6190af	7120af	7160af
			11760as	12035af	12095eu
			15360as	15460af	15565eu
			17760as	17790as	21660as
0400	0500		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
0400	0500		USA, KAIJ Dallas TX	5755va	
0400	0500		USA, KTBN Salt Lake City UT	7505na	
0400	0500		USA, KWHR Naalehu HI	17655as	
0400	0500		USA, Voice of America	4930af	4960af
			6080af	9575af	11835af
			15580af		12080af
0400	0500		USA, WBCQ Monticello ME	5110am	7415na
0400	0500		USA, WBOH Newport NC	5920am	
0400	0500		USA, WEWN Vandiver AL	5810na	
0400	0500		USA, WHRA Greenbush ME	5890na	
0400	0500	mtwhf	USA, WHRI Cypress Creek SC		5835am
0400	0500	Sat/Sun	USA, WHRI Cypress Creek SC		7315am
0400	0500		USA, WHRI Cypress Creek SC		7490am
0400	0500		USA, WMLK Bethel PA	9265va	
0400	0500		USA, WRMI Miami FL	9955va	
0400	0500		USA, WTJC Newport NC	9370na	
0400	0500		USA, WWCR Nashville TN	3215na	5070na
			5890na	5935na	
0400	0500		USA, WWRB Manchester TN	3185va	5050va
			6890na		
0400	0500		USA, WYFR/Family Radio FL	6855na	7780va
			9715am		
0400	0500		Uzbekistan, CVC International		13680as
0430	0500		Australia, Radio Australia	9660as	12080as
			13670as	15240pa	15415as
			17750va	21725va	15515va
0430	0500		Nigeria, Radio/Kaduna	6090do	
0430	0500		Swaziland, TWR	3200af	4775af
0430	0500	Sat	USA, WWRB Manchester TN	5745am	
0445	0500		Italy, RAI Italia	6110af	6145af
0459	0500	DRM	New Zealand, Radio NZ Intl	9890pa	7235af

### 0500 UTC - 1AM EDT / 12AM CDT / 10PM PDT

0500	0507	twhf	Canada, CBC NQ SW Service	9625na	
0500	0515	Sun	Sri Lanka, SLBC	6005as	9770as
0500	0530	mtwhf	France, Radio France Intl	11995af	13680af
0500	0530		Germany, Deutsche Welle	5945af	9700af
0500	0530		Vatican City, Vatican Radio	4005eu	7250eu
			9660af	11625af	13765af
0500	0555		South Africa, Channel Africa	9685af	
0500	0559		South Africa, Channel Africa	7240af	
0500	0600		Anguilla, University Network	6090am	
0500	0600		Armenia, CVC International	15515as	
0500	0600		Australia, ABC NT Alice Springs		2310do
			4835do		
0500	0600		Australia, ABC NT Katherine	5025do	
0500	0600		Australia, ABC NT Tennant Creek		4910do
0500	0600		Australia, Radio Australia	9660as	12080as
			13670as	15160as	15240pa
			17750va		15515as
0500	0600		Bhutan, BBS	6035as	
0500	0600		Canada, CFRX Toronto ON	6070na	
0500	0600		Canada, CKZN St John's NF	6160na	
0500	0600		Canada, CKZU Vancouver BC		6160na

0500	0600		China, China Radio Intl	6020na	6190na
			11710af	11880as	15350as
			17505as	17540as	17725as
0500	0600		Costa Rica, University Network		5030va
			6150va	7375va	9725va
0500	0600		Cuba, Radio Havana	6000na	6060na
			6180na	9550va	9600va
0500	0600		Germany, CVC Intl/Voice Africa		9430af
0500	0600		Guyana, Voice of 3291do		
0500	0600		Japan, Radio Japan/NHK World		5975eu
			6110na	7230eu	15195as
			21755pa		17810as
0500	0600		Kuwait, Radio Kuwait	15110as	
0500	0600		Malaysia, RTM/Trax FM	7295as	
0500	0600		Malaysia, RTM/Voice of Malaysia		6175as
			9750as	15295as	
0500	0600		New Zealand, Radio NZ Intl	9615pa	
0500	0600	DRM	New Zealand, Radio NZ Intl	9890pa	
0500	0600		Nigeria, Radio/Kaduna	4770do	6090al
0500	0600	vl	Papua New Guinea, Wantok R. Light		7325va
0500	0600		Russia, Voice of	17635pa	21790pa
0500	0600	DRM	Russia, Voice of	15735as	
0500	0600		Singapore, MediaCorp Radio	6150do	
0500	0600		Swaziland, TWR	3200af	4775af
0500	0600	vl	Uganda, Radio	4976do	5026do
0500	0600	DRM	UK, BBC World Service	7440eu	
0500	0600		UK, BBC World Service	3255af	6005af
			6190af	6195af	7160af
			11695af	11760as	11765af
			12095eu	15310as	15360as
			15565eu	17640af	17760as
			17885af	21660as	
0500	0600		Ukraine, Radio Ukraine Intl	9945eu	
0500	0600		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
0500	0600		USA, KAIJ Dallas TX	5755va	
0500	0600		USA, KTBN Salt Lake City UT	7505na	
0500	0600		USA, KWHR Naalehu HI	13650as	
0500	0600		USA, Voice of America	4930af	6080af
			6180af	12080af	15580af
0500	0600		USA, WBCQ Monticello ME	5110am	7415na
0500	0600		USA, WBOH Newport NC	5920am	
0500	0600		USA, WEWN Vandiver AL	5850na	
0500	0600		USA, WHRA Greenbush ME	6145na	
0500	0600	Sat/Sun	USA, WHRI Cypress Creek SC		7315am
0500	0600		USA, WMLK Bethel PA	9265va	
0500	0600		USA, WRMI Miami FL	9955va	
0500	0600		USA, WTJC Newport NC	9370na	
0500	0600		USA, WWCR Nashville TN	3215na	5070na
			5890na	5935na	
0500	0600		USA, WWRB Manchester TN	3185va	
0500	0600		USA, WYFR/Family Radio FL	6855na	9355va
0500	0600		Uzbekistan, CVC International		13680as
0505	0520	m	Zambia, CVC International	9430af	
0505	0520		Austria, Radio Austria Intl	17870me	
0505	0530	Sat/Sun	Austria, Radio Austria Intl	17870me	
0515	0530	vl	Rwanda, Radio	6055do	
0530	0556		Romania, Radio Romania Intl	9655va	11830va
			15435va	17770va	
0530	0600	vl	Rwanda, Radio	6055do	
0530	0600		Thailand, Radio	17655eu	
0535	0600	Sat/Sun	Austria, Radio Austria Intl	17870me	
0545	0600	twhf	Austria, Radio Austria Intl	17870me	

### 0600 UTC - 2AM EDT / 1AM CDT / 11PM PDT

0600	0603		Croatia, Croatian Radio	6165eu	9470eu
			11610eu		
0600	0615	Sat/Sun	South Africa, TWR	11640af	
0600	0630		Australia, Radio Australia	9660as	12080as
			13670as	15160as	15240pa
			17750va		15515as
0600	0630	mtwhf	France, Radio France Intl	9765af	11725af
0600	0630		Germany, Deutsche Welle	7310af	15275af
0600	0630		Nigeria, Radio, Natl Svc/Abuja		7275do
0600	0630	mtwhf	UK, Sudan Radio Service	15440af	15505af
0600	0645	mtwhf	South Africa, TWR	11640af	
0600	0655		South Africa, Channel Africa	15255af	
0600	0658		New Zealand, Radio NZ Intl	9615pa	
0600	0658	DRM	New Zealand, Radio NZ Intl	9890pa	
0600	0700		Anguilla, University Network	6090am	
0600	0700		Armenia, CVC International	15515as	
0600	0700		Australia, ABC NT Alice Springs		2310do
			4835do		
0600	0700		Australia, ABC NT Katherine	5025do	
0600	0700		Australia, ABC NT Tennant Creek		4910do
0600	0700		Australia, CVC International	15335as	
0600	0700		Canada, CFRX Toronto ON	6070na	
0600	0700		Canada, CFVP Calgary AB	6030na	

0600	0700	Canada, CKZN St John's NF	6160na	
0600	0700	Canada, CKZU Vancouver BC	6160na	
0600	0700	China, China Radio Intl	11710af	11870as
		11880as	13660as	15140as
		15465as	17505as	17505as
		17710as		
0600	0700	Costa Rica, University Network	5030va	
		6150va	7375va	9725va
0600	0700	Cuba, Radio Havana	6000va	6060va
		6180na	9550va	9600va
0600	0700	Germany, CVC Intl/Voice Africa	15640af	
0600	0700	Greece, Voice of	11645eu	
0600	0700	Guyana, Voice of	3291do	
0600	0700	Japan, Radio Japan/NHK World	7230eu	
		11740as	11760as	13630va
		17870pa	21755pa	15195pa
0600	0700	Kuwait, Radio Kuwait	15110as	
0600	0700	Liberia, ELWA	4760do	
0600	0700	Malaysia, RTM/Trax FM	7295as	
0600	0700	Malaysia, RTM/Voice of Malaysia	6175as	
		9750as	15295as	
0600	0700	Nigeria, Radio/Kaduna	4770do	6090al
0600	0700	Papua New Guinea, Wantok R. Light	7325va	
0600	0700	Russia, Voice of	17635pa	21790pa
0600	0700	Singapore, MediaCorp Radio	6150do	
0600	0700	Solomon Islands, SIBC	5020do	9545al
0600	0700	Swaziland, TWR	3200af	4775af
0600	0700	UK, BBC World Service	17885af	9500af
0600	0700	UK, BBC World Service	3255af	6005af
		6190af	7475eu	7475eu
		9860as	11695as	11760af
		11955af	12095as	15310as
		15400af	17640as	11760as
		21660af		17790af
0600	0700	UK, BBC World Service	7440eu	
0600	0700	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	10320usb
0600	0700	USA, KAIJ Dallas TX	5755va	
0600	0700	USA, KTBH Salt Lake City UT	7505na	
0600	0700	USA, KWHR Naalehu HI	13650as	
0600	0700	USA, Voice of America	6080af	6180af
		12080af	15580af	
0600	0700	USA, WBCQ Monticello ME	5110am	7415na
0600	0700	USA, WBOH Newport NC	5920am	
0600	0700	USA, WEWN Vandiver AL	5850na	7570eu
0600	0700	USA, WBOH Greenbush ME	7490na	
0600	0700	USA, WHRI Cypress Creek SC	7335am	
		7365am	7490am	
0600	0700	USA, WMLK Bethel PA	9265va	
0600	0700	USA, WRMI Miami FL	9955va	
0600	0700	USA, WTJC Newport NC	9370na	
0600	0700	USA, WWCR Nashville TN	3215na	5070na
		5890na	5935na	
0600	0700	USA, WWRB Manchester TN	3185va	
0600	0700	USA, WYFR/Family Radio FL	6000am	7780va
		9680na	11530af	11580va
0600	0700	Vanuatu, Radio	4960do	
0600	0700	Yemen, Rep of Yemen Radio	9780me	
0600	0700	Zambia, CVC International	13650af	
0630	0700	Australia, Radio Australia	9660as	12080as
		13670as	15160as	15240pa
		15515as	17750va	15415as
0630	0700	Bulgaria, Radio	9600eu	11600eu
0630	0700	UK, BBC World Service	11990af	
0630	0700	UK, Sudan Radio Service	11945af	
0630	0700	UK, Sudan Radio Service	15445af	
0630	645	Vatican City, Vatican Radio	4005va	6185eu
		7250eu	9645eu	11625eu
		13765eu	15570af	11740eu
0645	0700	Albania, TWR Europe	11865eu	
0645	0700	Monaco, TWR Europe	9800eu	
0659	0700	New Zealand, Radio NZ Intl	7145pa	

### 0700 UTC - 3AM EDT / 2AM CDT / 12AM PDT

0700	0705	UK, BBC World Service	6005af	
0700	0727	Czech Rep, Radio Prague	9880eu	11600eu
0700	0727	Slovakia, Radio Slovakia Int	9440pa	15460pa
0700	0730	France, Radio France Intl	13675af	
0700	0745	USA, WYFR/Family Radio FL	7780va	
0700	0750	Albania, TWR Europe	11865eu	
0700	0750	Monaco, TWR Europe	9800eu	
0700	0800	Anguilla, University Network	6090am	
0700	0800	Australia, ABC NT Alice Springs	2310do	
		4835do		
0700	0800	Australia, ABC NT Katherine	5025do	
0700	0800	Australia, ABC NT Tennant Creek	4910do	
0700	0800	Australia, CVC International	15335as	
0700	0800	Australia, Radio Australia	9660as	9710as

		12080as	13630as	15160pa	15240pa
		15415as	17750va		
0700	0800	Canada, CFRX Toronto ON	6070na		
0700	0800	Canada, CFVP Calgary AB	6030na		
0700	0800	Canada, CKZN St John's NF	6160na		
0700	0800	Canada, CKZU Vancouver BC		6160na	
0700	0800	China, China Radio Intl	11880as	13660as	
		13710as	15450as	15465eu	17490eu
		17540as	17710as		
0700	0800	Costa Rica, University Network	5030va		
		6150va	7375va	9725va	
0700	0800	Germany, CVC Intl/Voice Africa	15640af		
0700	0800	Guyana, Voice of	3291do	5950do	
0700	0800	Kuwait, Radio Kuwait	15110as		
0700	0800	Liberia, ELWA	4760do		
0700	0800	Liberia, Star Radio	9525af		
0700	0800	Malaysia, RTM/Trax FM	7295as		
0700	0800	Malaysia, RTM/Voice of Malaysia	6175as		
		9750as	15295as		
0700	0800	Myanmar, Radio	9730do		
0700	0800	New Zealand, Radio NZ Intl	6095pa		
0700	0800	New Zealand, Radio NZ Intl	6095pa		
0700	0800	New Zealand, Radio NZ Intl	7145pa		
0700	0800	Nigeria, Radio/Kaduna	4770do	6090al	
0700	0800	Papua New Guinea, Wantok R. Light	7325va		
0700	0800	Russia, Voice of	17495pa	17635pa	21790pa
0700	0800	Singapore, MediaCorp Radio	6150do		
0700	0800	Solomon Islands, SIBC	5020do	9545al	
0700	0800	Swaziland, TWR	4775af	6120af	9500af
0700	0800	Taiwan, Radio Taiwan Intl	5950am		
0700	0800	UK, BBC World Service	9470eu		
0700	0800	UK, BBC World Service	6190af	7320eu	
		9470eu	9860af	11695as	11760me
		11765af	11955as	12095af	15310as
		15360as	15400af	15575as	17760as
		17830af	21660as		
0700	0800	UK, BBC World Service	17885af		
0700	0800	UK, Bible Voice BC	5945eu		
0700	0800	Ukraine, Radio Ukraine Intl	9945eu		
0700	0800	USA, American Forces Radio	4319usb	5446usb	
		5765usb	6350usb	7811usb	10320usb
		12133usb	13362usb		
0700	0800	USA, KAIJ Dallas TX	5755va		
0700	0800	USA, KTBH Salt Lake City UT	7505na		
0700	0800	USA, KWHR Naalehu HI	13650as		
0700	0800	USA, WBCQ Monticello ME	5110am	7415na	
0700	0800	USA, WBOH Newport NC	5920am		
0700	0800	USA, WEWN Vandiver AL	5850na	7570eu	
0700	0800	USA, WHRI Cypress Creek SC	7335am		
		7365am			
0700	0800	USA, WMLK Bethel PA	9265va		
0700	0800	USA, WRMI Miami FL	9955va		
0700	0800	USA, WTJC Newport NC	9370na		
0700	0800	USA, WWCR Nashville TN	3215na	5070na	
		5890na	5935na		
0700	0800	USA, WWRB Manchester TN	3185va		
0700	0800	USA, WYFR/Family Radio FL	5985na	6855na	
		9505am	9715am	9930af	
0700	0800	Vanuatu, Radio	4960do		
0700	0800	Zambia, CVC International	13650af		
0715	0750	Albania, TWR Europe	11865eu		
0715	0750	Monaco, TWR Europe	9800eu		
0730	0800	Australia, HCJB Global	11750pa		
0730	0800	Pakistan, Radio	15100eu	17835eu	

### 0800 UTC - 4AM EDT / 3AM CDT / 1AM PDT

0800	0900	USA, WWRB Manchester TN	3185va	
0800	0815	UK, Bible Voice BC	5945eu	
0800	0820	Albania, TWR Europe	11865eu	
0800	0820	Monaco, TWR Europe	9800eu	
0800	0825	Malaysia, RTM/Voice of Malaysia	6175as	
		9750as	15295as	
0800	0830	Australia, ABC NT Katherine	5025do	
0800	0830	Australia, ABC NT Tennant Creek	4910do	
0800	0830	Myanmar, Radio	9730do	
0800	0830	Pakistan, Radio	15100eu	17835eu
0800	0845	Guam, TWR/KTWR	11840pa	
0800	0845	UK, Bible Voice BC	5945eu	
0800	0845	USA, WYFR/Family Radio FL	9930af	
0800	0900	Anguilla, University Network	6090am	
0800	0900	Australia, ABC NT Alice Springs	2310do	
		4835do		
0800	0900	Australia, CVC International	15335as	
0800	0900	Australia, HCJB Global	11750pa	
0800	0900	Australia, Radio Australia	5995va	9580va
		9590va	9710as	12080va
		15415va	17750va	
0800	0900	Canada, CFRX Toronto ON	6070na	
0800	0900	Canada, CFVP Calgary AB	6030na	



0800	0900	Canada, CKZN St John's NF	6160na	
0800	0900	Canada, CKZU Vancouver BC	6160na	
0800	0900	China, China Radio Intl	11620as	11880as
		13710eu	15350as	15465as
		17540as	17490eu	
0800	0900	Costa Rica, University Network	5030va	
		6150va	7375va	9725va
		11870va	15640af	
0800	0900	Germany, CVC Intl/Voice Africa		
0800	0900	Greece, Voice of	9420eu	15630eu
0800	0900	Guam, TWR/KTWR		11840pa
0800	0900	Guyana, Voice of	3291do	5950do
0800	0900	Indonesia, Voice of		9525as
		15150al	11785pa	
0800	0900	Latvia, Radio SWH		9290eu
0800	0900	Liberia, ELWA	4760do	
0800	0900	Malaysia, RTM/Trax FM		7295as
0800	0900	New Zealand, Radio NZ Intl		6095pa
0800	0900	New Zealand, Radio NZ Intl		7145pa
0800	0900	Nigeria, Radio/Kaduna		4770do
0800	0900	Nigeria, Voice of/Ext. Svc Lagos		6090al
0800	0900	Papua New Guinea, NBC		4890do
0800	0900	Papua New Guinea, Wantok R. Light		7325va
0800	0900	Russia, Voice of	17495pa	17635pa
0800	0900	Russia, Voice of	12060eu	15780eu
0800	0900	Singapore, MediaCorp Radio		6150do
0800	0900	Solomon Islands, SIBC		5020do
0800	0900	South Africa, Channel Africa		9620af
0800	0900	South Korea, KBS World Radio		9570as
0800	0900	Swaziland, TWR	4775af	6120af
0800	0900	Taiwan, Radio Taiwan Intl		11715pa
0800	0900	UK, BBC World Service		9480eu
0800	0900	UK, BBC World Service		6190af
		9470eu	9740as	9860af
		15310as	15360as	15400af
		17760as	17790as	17830af
		21470af	21660as	17885af
0800	0900	UK, BBC World Service		6195as
0800	0900	Ukraine, Radio Ukraine Intl		9945eu
0800	0900	USA, American Forces Radio		4319usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	10320usb
0800	0900	USA, KAIJ Dallas TX		5755va
0800	0900	USA, KNLS Anchor Point AK		7355as
0800	0900	USA, KTNB Salt Lake City UT		7505na
0800	0900	USA, KWHR Naalehu HI		9930as
0800	0900	USA, WBOH Newport NC		5920am
0800	0900	USA, WEWN Vandiver AL		5850na
0800	0900	USA, WHRI Cypress Creek SC		7335am
0800	0900	USA, WMLK Bethel PA		9265va
0800	0900	USA, WRMI Miami FL		9955va
0800	0900	USA, WTJC Newport NC		9370na
0800	0900	USA, WWCR Nashville TN		3215na
		5890na	5935na	5070na
0800	0900	USA, WYFR/Family Radio FL		5985na
0800	0900	Vanuatu, Radio		4960do
0800	0900	Zambia, CVC International		13650af
0805	0900	Guam, TWR/KTWR		15170as
0815	0845	UK, Bible Voice BC		9655eu
0830	0900	Australia, ABC NT Katherine		2485do
0830	0900	Australia, ABC NT Tennant Creek		2325do
0830	0900	Lithuania, Radio Vilnius		9710eu

### 0900 UTC - 5AM EDT / 4AM CDT / 2AM PDT

0900	0900	USA, WBCQ Monticello ME	5110am	7415na
0900	0927	Czech Rep, Radio Prague		9800eu
0900	0930	Australia, HCJB Global		11750pa
0900	1000	Anguilla, University Network		6090am
0900	1000	Australia, ABC NT Alice Springs		2310do
		4835do		
0900	1000	Australia, ABC NT Katherine		2485do
0900	1000	Australia, ABC NT Tennant Creek		2325do
0900	1000	Australia, CVC International		11955as
0900	1000	Australia, Radio Australia		9580va
		15415as		9590va
0900	1000	Bhutan, BBS		6035as
0900	1000	Canada, CFRX Toronto ON		6070na
0900	1000	Canada, CFVP Calgary AB		6030na
0900	1000	Canada, CKZN St John's NF		6160na
0900	1000	Canada, CKZU Vancouver BC		6160na
0900	1000	China, China Radio Intl		11620as
		15350as	17490eu	15210pa
0900	1000	Costa Rica, University Network		5030va
		6150va	7375va	9725va
		13750va	11870va	
0900	1000	Germany, Deutsche Welle		15340as
0900	1000	Greece, Voice of		9420eu
0900	1000	Guyana, Voice of		3291do
0900	1000	Liberia, ELWA		4760do

0900	1000	Malaysia, RTM/Trax FM		7295as
0900	1000	New Zealand, Radio NZ Intl		6095pa
0900	1000	New Zealand, Radio NZ Intl		7145pa
0900	1000	Nigeria, Radio/Kaduna		4770do
0900	1000	Nigeria, Voice of/Ext. Svc Lagos		6090al
0900	1000	Papua New Guinea, NBC		4890do
0900	1000	Papua New Guinea, Wantok R. Light		7325va
0900	1000	Saudi Arabia, BSKSA		15250af
0900	1000	Singapore, MediaCorp Radio		6150do
0900	1000	Solomon Islands, SIBC		5020do
0900	1000	South Africa, Channel Africa		9620af
0900	1000	UK, BBC World Service		9480eu
0900	1000	UK, BBC World Service		9605as
0900	1000	UK, BBC World Service		6190af
		7320eu	9470eu	9740eu
		11760me	15310as	15360as
		15575as	17760as	17830af
		21470af		17885af
0900	1000	USA, American Forces Radio		4319usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	10320usb
0900	1000	USA, KAIJ Dallas TX		5755va
0900	1000	USA, KTNB Salt Lake City UT		7505na
0900	1000	USA, KWHR Naalehu HI		9930as
0900	1000	USA, WBCQ Monticello ME		5110am
0900	1000	USA, WBOH Newport NC		5920am
0900	1000	USA, WEWN Vandiver AL		5850na
0900	1000	USA, WHRI Cypress Creek SC		7335am
0900	1000	USA, WRMI Miami FL		9955va
0900	1000	USA, WTJC Newport NC		9370na
0900	1000	USA, WWCR Nashville TN		5070na
		5935na	9985na	5890na
0900	1000	USA, WWRB Manchester TN		3185va
0900	1000	USA, WYFR/Family Radio FL		5985na
		9450va	9755am	6885na
0900	1000	Vanuatu, Radio		4960do
0900	1000	Zambia, CVC International		13650af
0930	0945	Israel, Kol Israel		13855eu
0930	1000	Italy, IRRS		9510eu

### 1000 UTC - 6AM EDT / 5AM CDT / 3AM PDT

1000	1003	Croatia, Croatian Radio		9830pa
1000	1030	Mongolia, Voice of		12085va
1000	1030	UK, BBC World Service		9605as
1000	1058	New Zealand, Radio NZ Intl		6095pa
1000	1100	Anguilla, University Network		11775am
1000	1100	Australia, ABC NT Alice Springs		4835do
1000	1100	Australia, ABC NT Katherine		2485do
1000	1100	Australia, ABC NT Tennant Creek		2325do
1000	1100	Australia, CVC International		11955as
1000	1100	Australia, CVC International		9760eu
1000	1100	Australia, HCJB Global		15540va
1000	1100	Australia, Radio Australia		9580va
		15415as		9590va
1000	1100	Austria, CVC International		11815eu
1000	1100	Canada, CFRX Toronto ON		6070na
1000	1100	Canada, CFVP Calgary AB		6030na
1000	1100	Canada, CKZN St John's NF		6160na
1000	1100	Canada, CKZU Vancouver BC		6160na
1000	1100	China, China Radio Intl		11635as
		15190as	15210as	13620as
		17690as	15350eu	13720as
1000	1100	Costa Rica, University Network		5030va
		6150va	7375va	9725va
		13750va	11870va	
1000	1100	Guyana, Voice of		3291do
1000	1100	India, All India Radio		7270as
		15020as	15260as	13695va
		17800as	17895pa	15410as
1000	1100	Italy, IRRS		9510eu
1000	1100	Japan, Radio Japan/NHK World		6120na
		9650va	9695as	11730as
		17585eu		11890pa
1000	1100	Liberia, ELWA		4760do
1000	1100	Malaysia, RTM/Trax FM		7295as
1000	1100	Netherlands, Radio		13710as
		13820as		12065as
1000	1100	New Zealand, Radio NZ Intl		7145pa
1000	1100	Nigeria, Radio/Kaduna		4770do
1000	1100	Nigeria, Voice of/Ext. Svc Lagos		6090al
1000	1100	North Korea, Voice of Korea		11710am
		13650as		11735as
1000	1100	Papua New Guinea, NBC		4890do
1000	1100	Papua New Guinea, Wantok R. Light		7325va
1000	1100	Saudi Arabia, BSKSA		15250af
1000	1100	Singapore, MediaCorp Radio		6150do

1000	1100	vi	Solomon Islands, SIBC	5020do	9545al
1000	1100		South Africa, Channel Africa	9620af	
1000	1100		UK, BBC World Service	6190af	6195as
			7320eu	9470eu	9740as
			11760me	15310as	15575as
			17790as	17885af	21470af
1000	1100	Sat/Sun	UK, BBC World Service	15400af	
1000	1100		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
1000	1100		USA, KAIJ Dallas TX	5755va	
1000	1100		USA, KNLS Anchor Point AK	6890as	7355al
1000	1100		USA, KTBN Salt Lake City UT	7505na	
1000	1100		USA, KWHR Naalehu HI	9930as	
1000	1100		USA, WBCQ Monticello ME	5110am	7415na
1000	1100		USA, WBOH Newport NC	5920am	
1000	1100		USA, WEWN Vandiver AL	5850na	
1000	1100		USA, WHRI Cypress Creek SC	7335am	7315am
1000	1100		USA, WRMI Miami FL	9955va	
1000	1100		USA, WTJC Newport NC	9370na	
1000	1100		USA, WWCR Nashville TN	5070na	5890na
			9985na	15825na	
1000	1100		USA, WWRB Manchester TN	3185va	
1000	1100		USA, WYFR/Family Radio FL	5950na	5985na
			6855na	7855am	9450va
					9755am
1000	1100		Zambia, CVC International	13590af	
1015	1045	Sun	UK, Bible Voice BC	5910as	
1030	1057		Czech Rep, Radio Prague	9880eu	11665eu
1030	1058		Vietnam, Voice of 7285as		
1030	1100		Iran, Voice of the Islamic Rep	15600as	17660as
1030	1100		UK, BBC World Service	9605as	11945as
			15285as	15360as	21660as
1059	1100		New Zealand, Radio NZ Intl	9870pa	

### 1100 UTC - 7AM EDT / 6AM CDT / 4AM PDT

1100	1115	Sun	UK, Bible Voice BC	5945as	
1100	1128		Vietnam, Voice of 9840as	7220as	7285as
1100	1130		Australia, HCJB Global	15540va	
1100	1130		Iran, Voice of the Islamic Rep	15600as	17600as
1100	1145		USA, WYFR/Family Radio FL	9550am	9755am
1100	1158	DRM	New Zealand, Radio NZ Intl	7145pa	
1100	1200		Anguilla, University Network	11775am	
1100	1200		Australia, ABC NT Alice Springs	4835do	2310do
1100	1200		Australia, ABC NT Katherine	2485do	
1100	1200		Australia, ABC NT Tennant Creek		2325do
1100	1200		Australia, CVC International	13635as	
1100	1200	DRM	Australia, Radio Australia	12080va	
1100	1200		Australia, Radio Australia	5995va	6020va
			9475as	9560pa	9580va
			12080as		9590va
1100	1200	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1100	1200		Canada, CFRX Toronto ON	6070na	
1100	1200		Canada, CFVP Calgary AB	6030na	
1100	1200		Canada, CKZN St John's NF	6160na	
1100	1200		Canada, CKZU Vancouver BC		6160na
1100	1200		China, China Radio Intl	5955as	6040na
			11650as	11750na	11795as
			13645as	13650eu	13720as
1100	1200		Costa Rica, University Network	5030va	
			6150va	7375va	9725va
			13750va		11870va
1100	1200	Sun	Italy, IRRS	9510eu	
1100	1200		Japan, Radio Japan/NHK World		6120na
			9695as	11730as	
1100	1200	vi	Liberia, ELWA	4760do	
1100	1200		Malaysia, RTM/Trax FM	7295as	
1100	1200		Netherlands, Radio	11675na	
1100	1200		New Zealand, Radio NZ Intl	9870pa	
1100	1200		Nigeria, Radio/Kaduna	4770do	6090al
1100	1200		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1100	1200		Papua New Guinea, NBC	4890do	
1100	1200	vi	Papua New Guinea, Wantok R. Light		7325va
1100	1200		Saudi Arabia, BSKSA	15250af	
1100	1200		Singapore, Radio Singapore Intl	6080as	
			6150as		
1100	1200		South Africa, Channel Africa	9620af	
1100	1200		Taiwan, Radio Taiwan Intl	11715as	
1100	1200	Sat/Sun	UK, BBC World Service	9660am	15400af
			15575as		
1100	1200		UK, BBC World Service	6190af	6195as
			7320eu	9465sa	9470eu
			9860va	11760me	15310as
			17790as	17885af	21470af
1100	1200	mtwhf	UK, BBC World Service	15575as	17830af
1100	1200	Sat	UK, Bible Voice BC	5945as	
1100	1200		Ukraine, Radio Ukraine Intl	11550eu	
1100	1200		USA, American Forces Radio	4319usb	5446usb

			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
1100	1200		USA, KAIJ Dallas TX		5755va	
1100	1200		USA, KTBN Salt Lake City UT		7505na	
1100	1200		USA, KWHR Naalehu HI		9930as	
1100	1200		USA, WBOH Newport NC		5920am	
1100	1200		USA, WEWN Vandiver AL		5850na	
1100	1200		USA, WINB Red Lion PA		9265am	
1100	1200		USA, WRMI Miami FL		9955va	
1100	1200		USA, WTJC Newport NC		9370na	
1100	1200		USA, WWCR Nashville TN		5070na	5890na
			9985na	15825na		
1100	1200		USA, WWRB Manchester TN		3185va	
1100	1200		USA, WYFR/Family Radio FL		5985na	7780am
			9625am			
1100	1200		Zambia, CVC International		13590af	
1115	1130	twhf	UK, Bible Voice BC		5945as	
1115	1200	m	UK, Bible Voice BC		5945as	
1130	1145		UK, BBC World Service		7135as	11920as
1130	1200		Australia, HCJB Global		15400va	
1130	1200	mtwhfa	Australia, HCJB Global		15425va	
1130	1200		Bulgaria, Radio	11700eu	15700eu	
1130	1200		Guam, AWR/KSDA		15435as	
1130	1200	mtwhf	UK, BBC World Service		9660am	
1130	1200		Vatican City, Vatican Radio		15595va	17765va

### 1200 UTC - 8AM EDT / 7AM CDT / 5AM PDT

1200	1215	vi	UK, Bible Voice BC	5945as	
1200	1230	Sun	Australia, HCJB Global	15425va	
1200	1230		France, Radio France Intl	21620af	
1200	1230		Germany, AWR Europe	15435as	
1200	1230	DRM	UK, Bible Voice BC	5945eu	
1200	1245		USA, WYFR/Family Radio FL	5950na	5985na
1200	1256		Romania, Radio Romania Intl	11875eu	15220eu
1200	1258		New Zealand, Radio NZ Intl	9870pa	
1200	1259		Canada, Radio Canada Intl	9660as	15170as
1200	1259		Poland, Radio Polonia	9525eu	11805eu
1200	1300		Anguilla, University Network	11775am	
1200	1300		Australia, ABC NT Alice Springs	4835do	2310do
1200	1300		Australia, ABC NT Katherine	2485do	
1200	1300		Australia, ABC NT Tennant Creek		2325do
1200	1300		Australia, CVC International	13635as	
1200	1300	DRM	Australia, Radio Australia	5995va	
1200	1300		Australia, Radio Australia	5995va	6020va
			9475as	9560pa	9580va
					9590va
1200	1300	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1200	1300		Canada, CFRX Toronto ON	6070na	
1200	1300		Canada, CFVP Calgary AB	6030na	
1200	1300		Canada, CKZN St John's NF	6160na	
1200	1300		Canada, CKZU Vancouver BC		6160na
1200	1300		China, China Radio Intl	5955as	9460as
			9730as	9760pa	11650as
			11690as	11760pa	11980as
			13650eu	13790eu	17490eu
1200	1300		Costa Rica, University Network		9725va
			11870va	13750va	
1200	1300		Malaysia, RTM/Trax FM	7295as	
1200	1300	DRM	New Zealand, Radio NZ Intl	7145pa	
1200	1300		Nigeria, Radio/Kaduna	4770do	6090al
1200	1300		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1200	1300		Papua New Guinea, NBC	4890do	
1200	1300	vi	Papua New Guinea, Wantok R. Light		7325va
1200	1300		Singapore, Radio Singapore Intl	6080as	
			6150as		
1200	1300		South Korea, KBS World Radio		9650na
1200	1300		UAE, AWR Africa	15140as	
1200	1300		UK, BBC World Service	6190af	6195as
			7320eu	9465sa	9470eu
			9660am	9860af	11750as
			15310as	15575as	17790as
			21470af		17885af
1200	1300	mtwhf	UK, BBC World Service	17830af	
1200	1300		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
1200	1300		USA, KAIJ Dallas TX		9480va
1200	1300		USA, KNLS Anchor Point AK		9780as
1200	1300		USA, KTBN Salt Lake City UT		7505na
1200	1300		USA, KWHR Naalehu HI		12130as
1200	1300		USA, Voice of America		6140va
			9760va	11860as	
1200	1300		USA, WBOH Newport NC		5920am
1200	1300		USA, WEWN Vandiver AL		5850na
1200	1300		USA, WHRA Greenbush ME		17650na
1200	1300		USA, WHRI Cypress Creek SC		9495am
			17650am		
1200	1300		USA, WINB Red Lion PA		9265am
1200	1300		USA, WRMI Miami FL		9955va



1200	1300	USA, WTJC Newport NC	9370na	
1200	1300	USA, WWCN Nashville TN	5890na	9985na
		13845na	15825na	
1200	1300	USA, WWRB Manchester TN	3185va	
1200	1300	USA, WYFR/Family Radio FL	17555am	17750am
1200	1300	Zambia, CVC International	13590af	
1205	1220	m	Austria, Radio Austria Intl	6155va 13730va
			17715va	
1205	1230	Sat/Sun	Austria, Radio Austria Intl	6155va 13730va
			17715va	
1215	1230	twhf	Austria, Radio Austria Intl	17715va
1215	1300		Egypt, Radio Cairo	17835as
1230	1258		Vietnam, Voice of 9840as	12020as
1230	1300		Bangladesh, Bangla Betar	7185as
1230	1300		Sweden, Radio 13580va	15240na 15735va
1230	1300		Thailand, Radio 9835va	
1230	1300		Turkey, Voice of 13685eu	15450eu
1235	1300	Sat/Sun	Austria, Radio Austria Intl	6155va 13730va
			17715va	
1245	1300	Sat	Australia, HCJB Global	15425va
1245	1300	twhf	Austria, Radio Austria Intl	6155va 13730va
			17715va	
1245	1300	m	Austria, Radio Austria Intl	17715va

### 1300 UTC - 9AM EDT / 8AM CDT / 6AM PDT

1300	1327		Czech Rep, Radio Prague	13580eu	17540as
1300	1328		Serbia, International Radio Serbia		7240eu
1300	1330	twhf	Albania, Radio Tirana	13750na	
1300	1330		Egypt, Radio Cairo	17835as	
1300	1330		Germany, Universal Life	15750as	
1300	1330	Sun	Italy, IRRS	15750as	
1300	1330		Turkey, Voice of 13685eu	15450eu	
1300	1400		Anguilla, University Network	11775am	
1300	1400		Armenia, CVC International	15615as	
1300	1400		Australia, CVC International	13635as	
1300	1400		Australia, Radio Australia	5995va	6020va
			9560as	9580va	9590va
1300	1400	DRM	Australia, Radio Australia	5995va	
1300	1400	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1300	1400		Canada, CFRX Toronto ON	6070na	
1300	1400		Canada, CFVP Calgary AB	6030na	
1300	1400		Canada, CKZN St John's NF	6160na	
1300	1400		Canada, CKZU Vancouver BC	6160na	
1300	1400		China, China Radio Intl	5955as	9570na
			9650as	9730as	9760pa
			9870as	11660as	11760pa
			13610eu	13755as	13790eu
			17625sa		15260na
1300	1400		Costa Rica, University Network		9725va
			11870va	13750va	
1300	1400		Germany, Overcomer Ministries		6110na
1300	1400	vl/Sat	Greece, Voice of 9420eu	15630eu	
1300	1400	Sun	Latvia, Radio SWH	9290eu	
1300	1400		Malaysia, RTM/Trax FM	7295as	
1300	1400		New Zealand, Radio NZ Intl	6095pa	
1300	1400		Nigeria, Radio/Kaduna	4770do	6090al
1300	1400		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1300	1400		North Korea, Voice of Korea	9335na	11710na
			13650as	15180ca	
1300	1400		Papua New Guinea, NBC	4890do	
1300	1400	vl	Papua New Guinea, Wantok R. Light		7325va
1300	1400		Singapore, Radio Singapore Intl		6080as
			6150as		
1300	1400		South Korea, KBS World Radio		9570na
			9770as		
1300	1400		UK, BBC World Service	6190af	6195as
			7320eu	9740as	9860af
			11760me	15310as	15420af
			17885af	21470af	17790as
1300	1400	Sat/Sun	UK, BBC World Service	15575as	
1300	1400	mtwhf	UK, BBC World Service	17830af	
1300	1400		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
1300	1400		USA, KAIJ Dallas TX	9480va	
1300	1400		USA, KJES Vado NM	11715na	
1300	1400		USA, KTNB Salt Lake City UT	7505na	
1300	1400		USA, KWHR Naalehu HI	12130as	
1300	1400		USA, Voice of America	9645va	9760va
1300	1400	w f	USA, WBCQ Monticello ME	9330am	
1300	1400		USA, WBOH Newport NC	5920am	
1300	1400		USA, WEWN Vandiver AL	5850na	
1300	1400		USA, WHRA Greenbush ME	17650na	
1300	1400	mtwhf	USA, WHRI Cypress Creek SC		9495am
1300	1400		USA, WHRI Cypress Creek SC		17650am
1300	1400		USA, WINB Red Lion PA	13570am	
1300	1400		USA, WRMI Miami FL	9955va	
1300	1400		USA, WTJC Newport NC	9370na	
1300	1400		USA, WWCN Nashville TN	5890na	9985na

1300	1400		13845na	15825na	
1300	1400		USA, WWRB Manchester TN	9385na	
			USA, WYFR/Family Radio FL	11830na	11865na
			11895na	11910na	17750na
1300	1400		Zambia, CVC International	13590af	
1330	1357	DRM/f-a	Czech Rep, Radio Prague	9850eu	
1330	1400	DRM	Canada, Radio Canada Intl	7240eu	
1330	1400	twfha	Guam, AWR/KSDA	15275as	
1330	1400		India, All India Radio	9690as	11620as
			13710as		
1330	1400		Laos, National Radio	7145as	
1330	1400		Sweden, Radio 15240na	15735va	
1330	1400		UK, BBC World Service	7465eu	
1345	1400		Guam, TWR/KTWR	9975as	

### 1400 UTC - 10AM EDT / 9AM CDT / 7AM PDT

1400	1415	t h	Germany, Pan American BC	13645me	
1400	1415	twf	Russia, FEBA	9500eu	
1400	1430		Australia, Radio Australia	5995va	6080va
			7240as	9590va	
1400	1430	fa	Guam, TWR/KTWR		9975as
1400	1430	DRM	Romania, Radio Romania Intl		9600eu
1400	1430		Thailand, Radio 9805va		
1400	1430	tha	UK, Sudan Radio Service		15470af
1400	1500		Anguilla, University Network		11775am
1400	1500		Armenia, CVC International		15615as
1400	1500		Australia, CVC International		13635as
1400	1500		Bhutan, BBS		6035as
1400	1500	Sat/Sun	Canada, CBC NQ SW Service		9625na
1400	1500		Canada, CFRX Toronto ON		6070na
1400	1500		Canada, CFVP Calgary AB		6030na
1400	1500		Canada, CKZN St John's NF		6160na
1400	1500		Canada, CKZU Vancouver BC		6160na
1400	1500		China, China Radio Intl		5955as
			9765as	9870eu	11675as
			11775as	13610eu	13710eu
			13790eu		
1400	1500		Costa Rica, University Network		9725va
			11870va	13750va	
1400	1500	Sat	Germany, Overcomer Ministries		17810eu
1400	1500		Germany, Overcomer Ministries		6110eu
			13810va		
1400	1500	mtw	Guam, TWR/KTWR		9975as
1400	1500		India, All India Radio		9690as
			13710as		11620as
1400	1500	Sun	Italy, IRRS		6125eu
1400	1500		Japan, Radio Japan/NHK World		7200as
			11730as	11840pa	
1400	1500		Jordan, Radio 11690na		
1400	1500		Libya, Voice of Africa		17775af
			21695af	21870af	17870af
1400	1500		Malaysia, RTM/Trax FM		7295as
1400	1500		Netherlands, Radio		9345as
			11835as		
1400	1500		New Zealand, Radio NZ Intl		6095pa
1400	1500		Nigeria, Radio/Kaduna		4770do
1400	1500		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1400	1500	vl	Papua New Guinea, Wantok R. Light		7325va
1400	1500		Russia, Voice of 6045as		7165as
			11755as	15695as	15660as
1400	1500	DRM	Russia, Voice of 9450eu		
1400	1500		Singapore, MediaCorp Radio		6150do
1400	1500		South Africa, Channel Africa		9620af
1400	1500		Taiwan, Radio Taiwan Intl		15265as
1400	1500	Sat	UK, BBC World Service		12095af
1400	1500	mtwhf	UK, BBC World Service		17830af
1400	1500		UK, BBC World Service		3255af
			6195as	7320eu	9740as
			11750as	11920as	15310as
			21470af	21660af	15575as
1400	1500	Sat/Sun	UK, Bible Voice BC		15680as
1400	1500		Ukraine, Radio Ukraine Intl		7530eu
1400	1500		USA, American Forces Radio		4319usb
			5765usb	6350usb	7811usb
			12133usb	13362usb	10320usb
1400	1500		USA, KAIJ Dallas TX		9480va
1400	1500		USA, KJES Vado NM		11715na
1400	1500		USA, KNLS Anchor Point AK		7355as
1400	1500		USA, KTNB Salt Lake City UT		7505na
1400	1500		USA, KWHR Naalehu HI		9930as
1400	1500		USA, Voice of America		4930af
			7125va	9760va	13570af
			15530va	17740va	15185va
1400	1500		USA, WBCQ Monticello ME		9330am
1400	1500		USA, WBOH Newport NC		5920am
1400	1500		USA, WEWN Vandiver AL		9955na
1400	1500		USA, WHRA Greenbush ME		17650na
1400	1500		USA, WHRI Cypress Creek SC		9840am
			11785am	17650am	

1400 1500	USA, WINB Red Lion PA	13570am	
1400 1500	USA, WRMI Miami FL	7385na	
1400 1500	USA, WTJC Newport NC	9370na	
1400 1500	USA, WWCR Nashville TN	9985na	12160na
	13845na	15825na	
1400 1500	USA, WWRB Manchester TN	9385na	
1400 1500	USA, WYFR/Family Radio FL	7320va	9865eu
	11830na	11910na	12150eu
	17750am		13695am
1400 1500	Zambia, CVC International	13590af	
1415 1430	Nepal, Radio	3230as	5005as
	7165as		6100as
1415 1445 m	UAE, FEBA	12025eu	
1430 1445 Sun	Germany, Pan American BC	13645as	13820as
1430 1445 twf	UAE, FEBA	12025eu	
1430 1500	Australia, Radio Australia	5995va	6080va
	7240as	9475as	9590va
			11660pa
1430 1500	Myanmar, Radio	5986as	
1430 1500 DRM	South Korea, KBS World Radio		9770eu

### 1500 UTC - 11AM EDT / 10AM CDT / 8AM PDT

1500 1510 mtwhfa	Turkmenistan, Turkmen Radio	5015eu	
1500 1528	Vietnam, Voice of 9550va	9840va	12020va
	13860va		
1500 1530 vl	Eritrea, Bana Radio	5100do	
1500 1530	Guam, AWR/KSDA	11640as	
1500 1530	Nigeria, Radio, Natl Svc/Abuja		7275do
1500 1530	UK, BBC World Service	9695af	11860af
	15420af		
1500 1530 ta	UK, Bible Voice BC	13840as	
1500 1545	Sweden, IBRA Radio	7340as	
1500 1545	USA, WYFR/Family Radio FL	15770am	
1500 1550	New Zealand, Radio NZ Intl	6095pa	
1500 1555	South Africa, Channel Africa	17770af	
1500 1557	Canada, Radio Canada Intl	11675as	17720as
1500 1559	Germany, Overcomer Ministries		17815na
1500 1559	Libya, Voice of Africa	17775af	17870af
	21695af	21870af	
1500 1559	South Africa, Channel Africa	9620af	
1500 1600	Anguilla, University Network	11775am	
1500 1600	Armenia, CVC International	15615as	
1500 1600	Australia, CVC International	13635as	
1500 1600	Australia, Radio Australia	5995va	6080va
	7240as	9475as	9590va
			11660pa
1500 1600 Sat/Sun	Canada, CBC NQ SW Service	9625na	
1500 1600	Canada, CFRX Toronto ON	6070na	
1500 1600	Canada, CFVP Calgary AB	6030na	
1500 1600	Canada, CKZN St John's NF	6160na	
1500 1600	Canada, CKZU Vancouver BC		6160na
1500 1600	China, China Radio Intl	5955as	6100as
	7160as	7325eu	9785as
			9870as
	11775as	11965eu	13640eu
	13740na	17630af	13685af
1500 1600	Costa Rica, University Network		9725va
	11870va	13750va	
1500 1600	Germany, CVC Intl/Voice Africa		15715af
1500 1600	Japan, Radio Japan/NHK World		6190as
	7200as	9505va	9525na
			11730as
1500 1600	Jordan, Radio	11690na	
1500 1600	Malaysia, RTM/Trax FM	7295as	
1500 1600	Netherlands, Radio	9345as	9890as
	11835as		
1500 1600	Nigeria, Radio/Kaduna	4770do	6090al
1500 1600	Nigeria, Voice of/ Ext. Svc Lagos		9690af
1500 1600	North Korea, Voice of Korea	9335na	11710na
	13760eu	15245eu	
1500 1600 vl	Papua New Guinea, Wantok R. Light		7325va
1500 1600	Russia, Voice of	4965me	4975me
	9625as	9660as	11985me
			12040eu
1500 1600	Singapore, MediaCorp Radio	6150do	
1500 1600	UAE, AWR Africa	11670as	
1500 1600 Sat	UK, BBC World Service	12095af	
1500 1600 mtwhf	UK, BBC World Service	17830af	
1500 1600	UK, BBC World Service	3255af	5975as
	6190af	6195as	7320af
			9740as
	9860af	11750as	11760as
			11920as
	15310as	15400af	15485af
	21660af		21470af
1500 1600	USA, American Forces Radio	4319usb	5446usb
	5765usb	6350usb	7811usb
	12133usb	13362usb	10320usb
1500 1600	USA, KAIJ Dallas TX	9480va	
1500 1600	USA, KBTN Salt Lake City UT	7505na	15590na
1500 1600	USA, KWHR Naalehu HI	9930as	
1500 1600	USA, Voice of America	4930af	6080af
	9590va	7125va	9590va
			9760va
	12080va	13735va	15105va
	15580af	17895af	15445va
1500 1600	USA, WBCQ Monticello ME	9330am	

1500 1600	USA, WBOH Newport NC	5920am	
1500 1600	USA, WEWN Vandiver AL	9955na	
1500 1600	USA, WHRA Greenbush ME	17650na	
1500 1600	USA, WHRI Cypress Creek SC		9840am
	11785am		
1500 1600 Sun	USA, WHRI Cypress Creek SC		15355am
1500 1600 mtwhfa	USA, WHRI Cypress Creek SC		17650am
1500 1600	USA, WINB Red Lion PA	13570am	
1500 1600	USA, WRMI Miami FL	7385na	
1500 1600	USA, WTJC Newport NC	9370na	
1500 1600	USA, WWCR Nashville TN	9985na	12160na
	13845na	15825na	
1500 1600	USA, WWRB Manchester TN	9385na	
1500 1600	USA, WYFR/Family Radio FL	7320va	11830na
	11910na	17750am	
1500 1600	Zambia, CVC International	15715af	
1505 1520 m	Austria, Radio Austria Intl	13775ca	
1505 1530 Sat/Sun	Austria, Radio Austria Intl	13775ca	
1505 1600 DRM	Canada, Radio Canada Intl	9800na	
1505 1600	Canada, Radio Canada Intl	9515na	
1510 1545	Swaziland, TWR	4760af	
1515 1530 twhf	Austria, Radio Austria Intl	13775ca	
1515 1600 Sat	UK, Bible Voice BC	15680as	
1530 1545	India, All India Radio	7255as	9910as
1530 1550	Vatican City, Vatican Radio	12065va	13765va
	15235va		
1530 1600	Germany, AWR Europe	15225as	
1530 1600	Iran, Voice of the Islamic Rep	7370as	9635as
1530 1600 Sun	UK, Bible Voice BC	13590me	
1530 1600 m	UK, Bible Voice BC	15680as	
1535 1600 Sat/Sun	Austria, Radio Austria Intl	13775ca	
1540 1600 mtwhf	UK, Bible Voice BC	13590me	
1545 1600 m	Austria, Radio Austria Intl	13775ca	
1545 1600 twhfa	Austria, Radio Austria Intl	13775ca	
1545 1600 Sun	Germany, Pan American BC	13820me	
1545 1600 Sat	UK, Bible Voice BC	13590me	
1551 1600	New Zealand, Radio NZ Intl	7145pa	
1551 1600 DRM	New Zealand, Radio NZ Intl	6095pa	

### 1600 UTC - 12PM EDT / 11AM CDT / 9AM PDT

1600 1605 DRM	Canada, Radio Canada Intl	9800na	
1600 1605 Sun	Croatia, Croatian Radio	6165eu	
1600 1615 mtwhfa	Croatia, Croatian Radio	6165eu	
1600 1615	Pakistan, Radio	9380va	11550af
1600 1615 twhf	UK, Bible Voice BC	13590me	11570va
1600 1620 mtwh	Moldova, Radio DMR Pridnestrovye		5965eu
1600 1627	Czech Rep, Radio Prague	5930eu	17485af
1600 1630 vl	Eritrea, Bana Radio	5100do	
1600 1630 h	Germany, Pan American BC	13820me	
1600 1630	Guam, AWR/KSDA	11640as	11805as
1600 1630	Iran, Voice of the Islamic Rep	7370as	7330as
1600 1630	Myanmar, Radio	9730do	
1600 1630	Nigeria, Voice of/ Ext. Svc Lagos		9690af
1600 1630 Sat/Sun	Swaziland, TWR	4760af	
1600 1630	UK, Bible Voice BC	13590me	
1600 1640 f	Moldova, Radio DMR Pridnestrovye		5965eu
1600 1645	USA, WYFR/Family Radio FL	11830na	11865na
	17750am		
1600 1700	Anguilla, University Network	11775am	
1600 1700	Australia, CVC International	13635as	
1600 1700	Australia, Radio Australia	5995va	6080va
	7240as	9475as	9710va
			11660pa
1600 1700 Sat	Canada, CBC NQ SW Service	9625na	
1600 1700	Canada, CFRX Toronto ON	6070na	
1600 1700	Canada, CFVP Calgary AB	6030na	
1600 1700	Canada, CKZN St John's NF	6160na	
1600 1700	Canada, CKZU Vancouver BC		6160na
1600 1700	Canada, Radio Canada Intl	9515na	
1600 1700	China, China Radio Intl	6100af	9570af
	11900eu	11940eu	11965eu
			13760eu
1600 1700	Costa Rica, University Network		11870va
	13750va		
1600 1700	Egypt, Radio Cairo	11740af	
1600 1700	Ethiopia, Radio	7165af	9560af
1600 1700	France, Radio France Intl	15160af	15605af
	17605af		
1600 1700	Germany, CVC Intl/Voice Africa		15715af
1600 1700	Germany, Deutsche Welle	6170as	9485as
	15640as		
1600 1700 Sun	Germany, Overcomer Ministries		17815na
1600 1700	Germany, Universal Life	7285va	
1600 1700 fs	Italy, IRRS	7285eu	
1600 1700	Jordan, Radio	11690na	
1600 1700	Malaysia, RTM/Trax FM	7295as	
1600 1700 DRM	New Zealand, Radio NZ Intl	6095pa	
1600 1700	New Zealand, Radio NZ Intl	7145pa	
1600 1700	Nigeria, Radio/Kaduna	4770do	6090al
1600 1700	North Korea, Voice of Korea	9990va	11545va
1600 1700 vl	Papua New Guinea, Wantok R. Light		7325va



1600	1700		Russia, Voice of	6070as	7350as	7370eu	
			9405as	9890eu	11985va	12055va	
			12115va				
1600	1700	vl	Rwanda, Radio	6055do			
1600	1700		South Korea, KBS World Radio			9515eu	
1600	1700		Taiwan, Radio Taiwan Intl	11550as	15515as		
1600	1700		UK, BBC World Service	3915af	5975as		
			6190af	6195as	7320eu	9510as	
			11760as	11920as	15400af	15485af	
			17840af	21470af	21660af		
1600	1700	DRM	UK, BBC World Service	7465eu			
1600	1700	mtwhf	UK, BBC World Service	17830af			
1600	1700	Sat/Sun	UK, BBC World Service	9695af	11860af		
			12095af				
1600	1700	Sun	UK, Bible Voice BC	13590me			
1600	1700		USA, American Forces Radio	4319usb	5446usb		
			5765usb	6350usb	7811usb	10320usb	
			12133usb	13362usb			
1600	1700		USA, KAIJ Dallas TX	9480va			
1600	1700		USA, KJES Vado NM	11715na			
1600	1700		USA, KTNB Salt Lake City UT	15590na			
1600	1700		USA, KWHR Naalehu HI	9930as			
1600	1700		USA, Voice of America	4930af	6080af		
			12080va	13600va	15580af	17895va	
1600	1700		USA, WBCQ Monticello ME	9330am			
1600	1700		USA, WBOH Newport NC	5920am			
1600	1700		USA, WEWN Vandiver AL	9450na			
1600	1700		USA, WHRA Greenbush ME	17640na			
1600	1700		USA, WHRI Cypress Creek SC		9840am		
			11960am	17640am			
1600	1700		USA, WINB Red Lion PA	13570am			
1600	1700	smtwhf	USA, WMLK Bethel PA	9265va	17495va		
1600	1700		USA, WRMI Miami FL	9955va			
1600	1700		USA, WTJC Newport NC	9370na			
1600	1700		USA, WWCN Nashville TN	9985na	12160na		
			13845na	15825na			
1600	1700		USA, WWRB Manchester TN	9385na			
1600	1700		USA, WYFR/Family Radio FL	6085am	13630af		
			13695na	15650af	15705af	18980va	
			21455va	21525af			
1600	1700		Zambia, CVC International	15715af			
1615	1630		Vatican City, Vatican Radio	4005va	7250va		
			9645va	15595va			
1615	1645	mtwhf	Swaziland, TWR	6130af			
1615	1700		UK, Bible Voice BC	13590me			
1630	1645		UK, Bible Voice BC	13590me			
1630	1657		Slovakia, Radio Slovakia Int	5920eu	6055eu		
1630	1700		Guam, AWR/KSDA	6155as			
1630	1700		Nigeria, Voice of/ Ext. Svc Lagos		15120af		
1630	1700	Sat/Sun	Swaziland, TWR	6130af			
1630	1700	Sun	UK, Bible Voice BC	13590me			
1640	1650	mtwhfa	Turkmenistan, Turkmen Radio	4930eu			
1645	1700	f	Sweden, IBRA Radio	9830as			
1645	1700		Tajikistan, Tajik Radio	7245as			

### 1700 UTC - 1PM EDT / 12PM CDT / 10AM PDT

1700	1704		Canada, Radio Canada Intl	9515na			
1700	1715		Swaziland, TWR	3200af			
1700	1715	vl	UK, Bible Voice BC	13590me			
1700	1725		Vietnam, Voice of 7280va	9550va	9725eu		
			11630va	13860va			
1700	1727		Czech Rep, Radio Prague	5930eu	17485af		
1700	1730		Jordan, Radio	11690na			
1700	1730	Sun	UK, Bible Voice BC	13590me			
1700	1730		UK, Bible Voice BC	13590me			
1700	1730	Sat/Sun	USA, Voice of America	4930af			
1700	1730		USA, Voice of America	6080af	15580af		
1700	1745		UK, BBC World Service	9630af			
1700	1755		South Africa, Channel Africa	15235af			
1700	1756		Romania, Radio Romania Intl	9535eu	11735eu		
1700	1759		Poland, Radio Polonia	7140eu	7265eu		
1700	1800		Anguilla, University Network	11775am			
1700	1800		Australia, CVC International	13635as			
1700	1800		Australia, Radio Australia	5995va	6080va		
			7240as	9475as	9580va	9710va	
			11660va	11880pa			
1700	1800	Sat	Canada, CBC NQ SW Service	9625na			
1700	1800		Canada, CFRX Toronto ON	6070na			
1700	1800		Canada, CFVP Calgary AB	6030na			
1700	1800		Canada, CKZN St John's NF	6160na			
1700	1800		Canada, CKZU Vancouver BC	6160na			
1700	1800		China, China Radio Intl	6100af	9570af		
			9695eu	11900af	13760eu		
1700	1800		Costa Rica, University Network		11870va		
			13750va				
1700	1800		Egypt, Radio Cairo	11740af			
1700	1800		Eqt. Guinea, Radio Africa	15190af			
1700	1800		Germany, CVC Intl/Voice Africa		15715af		
1700	1800		Germany, Universal Life	7285va			

1700	1800	fs	Italy, IRRS	7285eu			
1700	1800		Japan, Radio Japan/NHK World		9535va		
			11970eu	15355af			
1700	1800		Malaysia, RTM/Trax FM	7295as			
1700	1800		New Zealand, Radio NZ Intl	7145pa			
1700	1800	DRM	New Zealand, Radio NZ Intl	6095pa			
1700	1800		Nigeria, Radio/Kaduna	4770do	6090al		
1700	1800		Nigeria, Voice of/ Ext. Svc Lagos		15120af		
1700	1800	vl	Papua New Guinea, Wantok R. Light		7325va		
1700	1800		Russia, Voice of	7350as	9405as	9850af	
			11510af	11985af			
1700	1800	Sat/Sun	Russia, Voice of	9820eu	9890eu		
1700	1800	vl	Rwanda, Radio	6055do			
1700	1800		Taiwan, Radio Taiwan Intl		15690af		
1700	1800	mtwhf	UK, BBC World Service	17830af			
1700	1800	DRM	UK, BBC World Service	1296eu	7465eu		
1700	1800		UK, BBC World Service				
			3915as	5975as	6190af	6195eu	
			7320eu	7380af	9410va	9510as	
			11955as	12095af	15400af	15485af	
			17840af	21470af			
1700	1800	Sat	UK, Bible Voice BC	9430me			
1700	1800		USA, American Forces Radio	5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb			
1700	1800		USA, KAIJ Dallas TX	9480va			
1700	1800		USA, KTNB Salt Lake City UT	15590na			
1700	1800		USA, KWHR Naalehu HI	9930as			
1700	1800		USA, WBCQ Monticello ME	9330am	17495am		
1700	1800		USA, WBOH Newport NC	5920am			
1700	1800		USA, WEWN Vandiver AL	9450na	15390eu		
1700	1800		USA, WHRA Greenbush ME	15705na			
1700	1800		USA, WHRI Cypress Creek SC		9840am		
			11960am	15705am			
1700	1800		USA, WINB Red Lion PA	13570am			
1700	1800	smtwhf	USA, WMLK Bethel PA	9265va	17495va		
1700	1800		USA, WRMI Miami FL	9955va			
1700	1800		USA, WTJC Newport NC	9370na			
1700	1800		USA, WWCN Nashville TN	9985na	12160na		
			13845na	15825na			
1700	1800		USA, WWRB Manchester TN	9385na	12180na		
			15250va				
1700	1800		USA, WYFR/Family Radio FL	9890af	13630af		
			13690na	15650af	17795am	18980va	
			21455va				
1700	1800		Zambia, CVC International	15715af			
1700	1750		North Korea, Voice of Korea	9335na	11710na		
			12014na	15245na			
1705	1800	DRM	Canada, Radio Canada Intl	9800na			
1730	1745		Israel, Kol Israel	9345eu	13675eu		
1730	1800		Bulgaria, Radio	5900eu	9600eu		
1730	1800		Guam, AWR/KSDA		9980me		
1730	1800	vl	Liberia, ELWA	4760do			
1730	1800		Swaziland, TWR	9500af			
1730	1800	DRM	Sweden, Radio	5955eu			
1730	1800		Sweden, Radio	6065va			
1730	1800		UK, Bible Voice BC	9430me	13590me		
1730	1800	Sat/Sun	USA, Voice of America	4930af			
1730	1800		USA, Voice of America	6080af	15410af		
			15580af				
1730	1800	mtwhf	USA, Voice of America	4930af	13755af		
			15775af				
1730	1800		Vatican City, Vatican Radio	11625af	13765af		
			15570af				
1745	1800		Bangladesh, Bangla Betar	7185as			
1745	1800		India, All India Radio	7410eu	9445af		
			9950eu	11620eu	11935af	13605af	
			15075af	15155af	17670af		

### 1800 UTC - 2PM EDT / 1PM CDT / 11AM PDT

1800	1815	Sat	UK, Bible Voice BC	11875as			
1800	1828		Vietnam, Voice of 5955eu	7280va	9730va		
1800	1830	w	Austria, AWR Europe	15315af			
1800	1830	f	Italy, IRRS	7285eu			
1800	1830		Nigeria, Radio, Natl Svc/Abuja		7275do		
1800	1830		South Africa, AWR Africa	3215af	3345af		
			9610af				
1800	1830		UK, BBC World Service	5975as	11955as		
1800	1830	Sun	UK, Bible Voice BC	6060eu			
1800	1830		UK, Bible Voice BC	13590me			
1800	1830	Sat/Sun	USA, Voice of America	4930af			
1800	1830		USA, Voice of America	6080af	15410af		
			15580af	17895af			
1800	1845	Sat	UK, Bible Voice BC	6060eu			
1800	1845		USA, WYFR/Family Radio FL	17535af			
1800	1850		New Zealand, Radio NZ Intl	7145pa			
1800	1850	DRM	New Zealand, Radio NZ Intl	9870pa			
1800	1900		Anguilla, University Network	11775am			
1800	1900	mtwhf	Argentina, RAE	9690eu	15345eu		

1800 1900	Australia, Radio Australia	6080va	7240as	1900 1928	Vietnam, Voice of	7280va	9730va
	9475as	9500as	9580va	1900 1930	Germany, Deutsche Welle	17820af	9895af 11795as
	11880pa						
1800 1900	Bangladesh, Bangla Betar	7185eu		1900 1930	Turkey, Voice of	9785eu	
1800 1900	Canada, CFRX Toronto ON	6070na		1900 1930 Sat	UK, Bible Voice BC		9775af
1800 1900	Canada, CFVP Calgary AB	6030na		1900 1930	UK, Bible Voice BC		6060eu
1800 1900	Canada, CKZN St John's NF	6160na		1900 1945	India, All India Radio		7410eu 9445af
1800 1900	Canada, CKZU Vancouver BC		6160na		9950eu	11620eu	11935af 13605af
1800 1900	Canada, Radio Canada Intl	9530af	11765af		15075af	15155af	17670af
	15235af	17810af		1900 1945	USA, WYFR/Family Radio FL		6085am
1800 1900 DRM	Canada, Radio Canada Intl	9800na		1900 1957 Sat/Sun	Netherlands, Radio		15315na 17660va
1800 1900	China, China Radio Intl	9600eu	11940eu		17735af		
	13760eu			1900 2000	Anguilla, University Network		11775am
1800 1900	Costa Rica, University Network		11870va	1900 2000	Australia, Radio Australia	6080va	7240as
	13750va				9500as	9580va	9710va 11880pa
1800 1900	Eqt. Guinea, Radio Africa	15190af		1900 2000	Canada, CFRX Toronto ON		6070na
1800 1900	Germany, CVC Intl/Voice Africa		13820af	1900 2000	Canada, CFVP Calgary AB		6030na
1800 1900	Germany, Universal Life	7285va		1900 2000	Canada, CKZN St John's NF		6160na
1800 1900	India, All India Radio	7410eu	9445af	1900 2000	Canada, CKZU Vancouver BC		6160na
	9950eu	11620eu	11935af	1900 2000	China, China Radio Intl		7295va 9435va
	15075af	15155af	17670af		9440va	11940eu	
1800 1900 Sun	Italy, IRRS	7285eu		1900 2000	Costa Rica, University Network		11870va
1800 1900	Kuwait, Radio Kuwait		11990na		13750va		
1800 1900 vl	Liberia, ELWA	4760do		1900 2000	Egypt, Radio Cairo		15375af
1800 1900	Malaysia, RTM/Trax FM	7295as		1900 2000	Eqt Guinea, Radio Africa		15190af
1800 1900	Netherlands, Radio	6020af	7125af	1900 2000	Germany, CVC Intl/Voice Africa		13820af
	11655af			1900 2000 vl	Liberia, ELWA	4760do	
1800 1900	Nigeria, Radio/Kaduna	4770do	6090al	1900 2000	Malaysia, RTM/Trax FM		7295as
1800 1900	Nigeria, Voice of/ Ext. Svc Lagos		15120af	1900 2000	Netherlands, Radio		5905af 7115af
1800 1900	North Korea, Voice of Korea	13760eu	15245eu		11655af	17810af	
1800 1900 vl	Papua New Guinea, Wantok R. Light		7325va	1900 2000	New Zealand, Radio NZ Intl		9615pa
1800 1900	Russia, Voice of	7370eu	9745af	1900 2000 DRM	New Zealand, Radio NZ Intl		9890pa
	9890eu	11510af	11630eu	1900 2000	Nigeria, Radio/Kaduna		4770do 6090al
1800 1900 vl	Rwanda, Radio	6055do		1900 2000	Nigeria, Voice of/ Ext. Svc Lagos		15120af
1800 1900	South Korea, KBS World Radio		7275eu	1900 2000	North Korea, Voice of Korea		7100af 9975va
1800 1900	Swaziland, TWR	3200af	9500af		11535va	11910af	
1800 1900	Taiwan, Radio Taiwan Intl	3965eu		1900 2000	Papua New Guinea, NBC		4890do
1800 1900 DRM	UK, BBC World Service	7420eu		1900 2000 vl	Papua New Guinea, Wantok R. Light		7325va
1800 1900	UK, BBC World Service	5975as	5995as	1900 2000	Russia, Voice of	7195eu	7310eu 9890eu
	6190af	6195eu	7380af		12070eu		
	12095eu	15400af	17795af	1900 2000 vl	Rwanda, Radio	6055do	
1800 1900 mtwhf	UK, BBC World Service	17830af		1900 2000 vl	Solomon Islands, SIBC		5020do 9545al
1800 1900 Sat/Sun	UK, Bible Voice BC	9430me		1900 2000	Swaziland, TWR	3200af	
1800 1900	USA, American Forces Radio	4319usb	5446usb	1900 2000 vl	Uganda, Radio	4976do	5026do
	5765usb	6350usb	7811usb	1900 2000 DRM	UK, BBC World Service		7420eu
	12133usb	13362usb		1900 2000	UK, BBC World Service		5995as 6005as
1800 1900	USA, KAIJ Dallas TX	9480va			6190af	9410af	9455af 9485af
1800 1900	USA, KJES Vado NM	15385na			9630as	15400af	17795as
1800 1900	USA, KTBN Salt Lake City UT	15590na		1900 2000 mtwhf	UK, BBC World Service		17830af
1800 1900 smtwhf	USA, WBCQ Monticello ME	7415am		1900 2000 Sun	UK, Bible Voice BC		9775af
1800 1900	USA, WBCQ Monticello ME	9330am	17495am	1900 2000	Ukraine, Radio Ukraine Intl		7490eu
1800 1900	USA, WBOH Newport NC	5920am		1900 2000	USA, American Forces Radio		4319usb 5446usb
1800 1900	USA, WEWN Vandiver AL	9450na	15390eu		5765usb	6350usb	7811usb 10320usb
1800 1900	USA, WHRA Greenbush ME	15705na			12133usb	13362usb	
1800 1900	USA, WHRI Cypress Creek SC		9840am	1900 2000	USA, KAIJ Dallas TX		9480va
	11960am	15705am		1900 2000	USA, KJES Vado NM		15385na
1800 1900	USA, WINB Red Lion PA	13570am		1900 2000	USA, KTBN Salt Lake City UT		15590na
1800 1900 smtwhf	USA, WMLK Bethel PA	9265va	17495va	1900 2000	USA, Voice of America		4930af 4940af
1800 1900	USA, WRMI Miami FL	9955va			6080af	7480va	9670va 15410af
1800 1900	USA, WTJC Newport NC	9370na			15445af	15580af	17895af
1800 1900	USA, WWCN Nashville TN	9975na	12160na	1900 2000	USA, WBCQ Monticello ME		7415am 9330am
	13845na	15825na			17495am		
1800 1900	USA, WWRB Manchester TN	9385va	12180na	1900 2000	USA, WBOH Newport NC		5920am
	15250va			1900 2000	USA, WEWN Vandiver AL		9450na 15390eu
1800 1900	USA, WYFR/Family Radio FL	9845af	9860af	1900 2000	USA, WHRA Greenbush ME		13710na
	13630af	13690af	13730af	1900 2000	USA, WHRI Cypress Creek SC		9840am
	15650af	17795va	18980va		13710am	17650am	
1800 1900	Yemen, Rep of Yemen Radio	9780me		1900 2000	USA, WINB Red Lion PA		13570am
1800 1900	Zambia, CVC International	5940af		1900 2000 smtwhf	USA, WMLK Bethel PA		9265va 17495va
1805 1810 Sat	Croatia, Croatian Radio	6165eu		1900 2000	USA, WRMI Miami FL		9955va
1805 1815 mtwhf	Croatia, Croatian Radio	6165eu		1900 2000	USA, WTJC Newport NC		9370na
1830 1857	Slovakia, Radio Slovakia Int	5920eu	6055eu	1900 2000	USA, WWCN Nashville TN		9975na 12160na
1830 1858	Serbia, International Radio Serbia		7240eu		13845na	15825na	
1830 1900	Turkey, Voice of	9785eu		1900 2000	USA, WWRB Manchester TN		9385va 12180na
1830 1900	UK, BBC World Service		6005af 9485as		15250va		
	9630af			1900 2000	USA, WYFR/Family Radio FL		7240va 9860af
1830 1900 f	UK, Bible Voice BC	9430me			13690na	13800na	17795am 17845af
1830 1900	USA, Voice of America	4930af	6080af		18930eu		
	15410af	15580af		1900 2000	Zambia, CVC International		5940af
1845 1900 mtwhfa	Albania, Radio Tirana	6035eu	7465eu	1900 2000	Kuwait, Radio Kuwait		11990na
1845 1900	Congo, RTV Congolaise	4765af	5985af	1930 2000 Sat/Sun	Germany, Pan American BC		5850me
1845 1900 Sun	UK, Bible Voice BC	9775af		1930 2000	Iran, Voice of the Islamic Rep		6205eu 6255eu
1851 1900 DRM	New Zealand, Radio NZ Intl	9890pa			7205af	9800af	9925af
1851 1900	New Zealand, Radio NZ Intl	9615pa					6255eu
				1930 2000	Lithuania, Radio Vilnius		6255eu
				1930 2000	Sweden, Radio	6065va	
				1935 1955	Italy, RAI Italia	5960eu	9845eu
				1945 2000 DRM	Vatican City, Vatican Radio		9800na
				1950 2000	Vatican City, Vatican Radio		4005eu 5885eu
					9645eu		

## 1900 UTC - 3PM EDT / 2PM CDT / 12PM PDT

1900 1903	Bahrain, Radio Bahrain	6010as	
1900 1905 DRM	Canada, Radio Canada Intl	9800na	
1900 1915	Congo, RTV Congolaise	4765af	5985af



# 2000 UTC - 4PM EDT / 3PM CDT / 1PM PDT

2000 2015 Sun	Germany, Pan American BC	5850me	
2000 2020	Vatican City, Vatican Radio	4005af	5885af
	9645af		
2000 2027	Czech Rep, Radio Prague	5930eu	11600va
2000 2027	Lithuania, Radio Vilnius	6255eu	
2000 2030 twhf	Albania, Radio Tirana	7465eu	13720va
2000 2030	Egypt, Radio Cairo	15375af	
2000 2030	Germany, AWR Europe	15235as	
2000 2030 f	Germany, Pan American BC	5850me	
2000 2030	Iran, Voice of the Islamic Rep	6205eu	6255eu
	7205af	9800af	9925af
2000 2030	Swaziland, TWR	3200af	
2000 2030	Turkey, Voice of	6195eu	
2000 2030	USA, Voice of America	4930af	4940af
	6080af	15455af	15580af
2000 2030	Vatican City, Vatican Radio	7365af	9755af
	11625af		
2000 2030 DRM	Vatican City, Vatican Radio	9800na	
2000 2045	USA, WYFR/Family Radio FL	17750eu	
2000 2050	New Zealand, Radio NZ Intl	9615pa	
2000 2050 DRM	New Zealand, Radio NZ Intl	9890pa	
2000 2057	Germany, Deutsche Welle	7130af	11795af
2000 2059	Canada, Radio Canada Intl	5850eu	7235eu
	15325eu		
2000 2100	Anguilla, University Network	11775am	
2000 2100	Australia, ABC NT Alice Springs		2310do
	4835do		
2000 2100	Australia, ABC NT Katherine	2485do	
2000 2100	Australia, ABC NT Tennant Creek		2325do
2000 2100	Australia, Radio Australia	6080va	7240as
	9500as	11650pa	11650pa
	11880pa		11660pa
2000 2100	Canada, CFRX Toronto ON	6070na	
2000 2100	Canada, CFVP Calgary AB	6030na	
2000 2100	Canada, CKZN St John's NF	6160na	
2000 2100	Canada, CKZU Vancouver BC		6160na
2000 2100 DRM	Canada, Radio Canada Intl	9800na	
2000 2100	China, China Radio Intl	5960eu	7190eu
	7265eu	7295af	9440af
	9800eu	11640af	9600eu
		13630af	
2000 2100	Costa Rica, University Network		13750va
2000 2100	Eqt Guinea, Radio Africa	15190af	
2000 2100	Germany, CVC Intl/Voice Africa		13820af
2000 2100	Germany, Deutsche Welle	11865af	15205af
2000 2100	Indonesia, Voice of	9525eu	11785eu
	15150af		
2000 2100	Kuwait, Radio Kuwait	11990na	
2000 2100 vl	Liberia, ELWA	4760do	
2000 2100	Malaysia, RTM/Trax FM	7295as	
2000 2100	Netherlands, Radio	5905af	7115af
	17810af		
2000 2100 Sat/Sun	Netherlands, Radio	15315na	17660va
	17735na		
2000 2100	Nigeria, Radio/Kaduna	4770do	6090al
2000 2100	Nigeria, Voice of/ Ext. Svc Lagos		15120af
2000 2100	Papua New Guinea, NBC	4890do	
2000 2100 vl	Papua New Guinea, Wantok R. Light		7325va
2000 2100	Russia, Voice of	9890eu	12070eu
2000 2100 vl	Rwanda, Radio	6055do	
2000 2100 vl	Solomon Islands, SIBC	5020do	9545al
2000 2100	South Africa, Channel Africa	3345af	
2000 2100 mtwhf	Spain, Radio Exterior Espana	9665eu	11625af
2000 2100 vl	Uganda, Radio	4976do	5026do
2000 2100	UK, BBC World Service	6005af	6190af
	9410af	9455af	9630af
			15400af
2000 2100 mtwhf	UK, BBC World Service	17830af	
2000 2100 DRM	UK, BBC World Service	5875eu	
2000 2100	USA, American Forces Radio	4319usb	5446usb
	5765usb	6350usb	7811usb
	12133usb	13362usb	10320usb
2000 2100	USA, KAIJ Dallas TX	9480va	
2000 2100	USA, KJES Vado NM	15385na	
2000 2100	USA, KTBN Salt Lake City UT	15590na	
2000 2100	USA, WBCQ Monticello ME	7415am	9330am
	17495am		
2000 2100	USA, WBOH Newport NC	5920am	
2000 2100	USA, WEWN Vandiver AL	9450na	15220af
2000 2100 mtwhf	USA, WHRA Greenbush ME	7400na	
2000 2100 Sat/Sun	USA, WHRA Greenbush ME	11885na	
2000 2100	USA, WHRI Cypress Creek SC		17650am
2000 2100 Sat/Sun	USA, WHRI Cypress Creek SC		9840am
	11885am		
2000 2100 mtwhf	USA, WHRI Cypress Creek SC		7400am
	13670am		
2000 2100	USA, WINB Red Lion PA	13570am	
2000 2100 smtwhf	USA, WMLK Bethel PA	9265va	17495va
2000 2100	USA, WRMI Miami FL	9955va	

2000 2100	USA, WTJC Newport NC	9370na	
2000 2100	USA, WWCR Nashville TN	9975na	12160na
	13845na		
2000 2100	USA, WWRB Manchester TN	9385va	12180na
	15250va		
2000 2100	USA, WYFR/Family Radio FL	3230af	7430eu
	17725am	17845af	18980va
2000 2100	Zambia, CVC International		5940af
2005 2100	Syria, Radio Damascus	9330eu	12085eu
2020 2100	Belarus, Radio	7105eu	7390eu
	7440al		
2025 2045	Italy, RAI Italia	5970va	11875va
2030 2045	Thailand, Radio	9680eu	
2030 2056	Romania, Radio Romania Intl	9515va	11810va
	11940va	15465va	
2030 2058	Vietnam, Voice of	7280va	9550va
	13860va		9730va
2030 2100	Cuba, Radio Havana	9505va	11760va
2030 2100 DRM	Netherlands, Radio	9800na	
2030 2100	Turkey, Voice of	7170va	
2030 2100	USA, Voice of America	4930af	6080af
	7555as	15445af	15580af
2030 2100 Sat/Sun	USA, Voice of America		4940af
2045 2100	India, All India Radio	7410eu	9445eu
	9910pa	11620va	11715pa
2051 2100	New Zealand, Radio NZ Intl	15720pa	

# 2100 UTC - 5PM EDT / 4PM CDT / 2PM PDT

2100 2130	Australia, ABC NT Katherine	2485do	
2100 2130	Australia, ABC NT Tennant Creek		2325do
2100 2130	Austria, AWR Europe	11955af	
2100 2130 Sat	Canada, CBC NQ SW Service	9625na	
2100 2130	China, China Radio Intl	5960eu	7190eu
	7285eu	9490eu	9600eu
	13630af		11640af
2100 2130	Cuba, Radio Havana	9505va	11760va
2100 2130	Nigeria, Radio, Natl Svc/Abuja		7275do
2100 2130	South Korea, KBS World Radio		3955eu
2100 2130	Turkey, Voice of	7170va	
2100 2145	USA, WYFR/Family Radio FL	13800na	17795am
	18980va		
2100 2150 DRM	New Zealand, Radio NZ Intl	11675pa	
2100 2159 smtwhf	Germany, Overcomer Ministries		7310eu
2100 2159 Sat/Sun	Spain, Radio Exterior Espana	9840eu	11625af
2100 2200	Anguilla, University Network	11775am	
2100 2200	Australia, ABC NT Alice Springs		2310do
	4835do		
2100 2200	Australia, Radio Australia	9500as	9660as
	11650pa	11660pa	11695as
	13630as	15515as	12080as
2100 2200	Bulgaria, Radio	5900eu	9700eu
2100 2200	Canada, CFRX Toronto ON	6070na	
2100 2200	Canada, CFVP Calgary AB	6030na	
2100 2200	Canada, CKZN St John's NF	6160na	
2100 2200	Canada, CKZU Vancouver BC		6160na
2100 2200 DRM	Canada, Radio Canada Intl	9800na	
2100 2200	Costa Rica, University Network		13750va
2100 2200	Eqt Guinea, Radio Africa	15190af	
2100 2200	Germany, Deutsche Welle	9735af	11865af
	15205af		
2100 2200	Guyana, Voice of	3291do	5950do
2100 2200	India, All India Radio	7410eu	9445eu
	9910pa	11620va	11715pa
2100 2200	Japan, Radio Japan/NHK World	6035va	
	6055eu	6180eu	11855af
	17870pa		17825na
2100 2200 vl	Liberia, ELWA	4760do	
2100 2200	Malaysia, RTM/Trax FM	7295as	
2100 2200	New Zealand, Radio NZ Intl	15720pa	
2100 2200	Nigeria, Radio/Kaduna	4770do	6090al
2100 2200	Nigeria, Voice of/ Ext. Svc Lagos		7255af
2100 2200	North Korea, Voice of Korea	13760eu	15245eu
2100 2200	Papua New Guinea, NBC	4890do	
2100 2200 vl	Papua New Guinea, Wantok R. Light		7325va
2100 2200	South Africa, Channel Africa	3345af	
2100 2200	Syria, Radio Damascus	9330eu	12085eu
2100 2200	UK, BBC World Service	3915as	6005af
	6190af	6195af	11675am
	12095af	13640am	15400af
2100 2200 DRM	UK, BBC World Service	5875eu	
2100 2200	Ukraine, Radio Ukraine Intl	7510eu	
2100 2200	USA, American Forces Radio	4319usb	5446usb
	5765usb	6350usb	7811usb
	12133usb	13362usb	10320usb
2100 2200	USA, KAIJ Dallas TX	9480va	
2100 2200	USA, KTBN Salt Lake City UT	15590na	
2100 2200	USA, Voice of America	6080af	15580af
2100 2200	USA, WBCQ Monticello ME	7415am	9330am

2100	2200	17495am		
2100	2200	USA, WBOH Newport NC	5920am	
2100	2200	USA, WEWN Vandiver AL	9450na	15220af
2100	2200	mtwhf USA, WHRA Greenbush ME	7400na	
2100	2200	Sat/Sun USA, WHRA Greenbush ME	11885na	
2100	2200	mtwhf USA, WHRI Cypress Creek SC	7400am	
		13670am		
2100	2200	Sat/Sun USA, WHRI Cypress Creek SC	11885am	
2100	2200	USA, WINB Red Lion PA	13570am	
2100	2200	mtwhfa USA, WRMI Miami FL	9955va	
2100	2200	Sun USA, WRMI Miami FL	7385na	
2100	2200	USA, WTJC Newport NC	9370na	
2100	2200	USA, WWCR Nashville TN	9975na	12160na
		13845na		
2100	2200	USA, WWRB Manchester TN	9385va	12180na
		15250va		
2100	2200	USA, WYFR/Family Radio FL	3230af	7430eu
		9610af	11565eu	17795am
2115	2200	Egypt, Radio Cairo	9990eu	
2130	2157	Czech Rep, Radio Prague	9410af	11600na
2130	2200	Australia, ABC NT Katherine	5025do	
2130	2200	Australia, ABC NT Tennant Creek	4910do	
2130	2200	mtwhfa Canada, CBC NQ SW Service	9625na	
2130	2200	Guam, AWR/KSDA	11850as	
2130	2200	Sweden, Radio	6065va	7420va
2151	2200	DRM New Zealand, Radio NZ Intl	13730pa	

### 2200 UTC - 6PM EDT / 5PM CDT / 3PM PDT

2200	2210	Syria, Radio Damascus	9330eu	12085eu
2200	2230	DRM Germany, Deutsche Welle	9800na	
2200	2230	India, All India Radio	7410eu	9445eu
		9910pa	11620va	11715pa
2200	2230	vi Liberia, ELWA	4760do	
2200	2230	Papua New Guinea, NBC	4890do	
2200	2245	Egypt, Radio Cairo	9990eu	
2200	2245	USA, WYFR/Family Radio FL	15770af	
2200	2256	Romania, Radio Romania Intl	7185va	9675va
		9790va	11940va	
2200	2300	Anguilla, University Network	6090am	
2200	2300	Australia, ABC NT Alice Springs	2310do	
		4835do		
2200	2300	Australia, ABC NT Katherine	5025do	
2200	2300	Australia, ABC NT Tennant Creek	4910do	
2200	2300	Australia, Radio Australia	13620va	13630va
		15230va	15240pa	15515as
2200	2300	smtwhf Canada, CBC NQ SW Service	9625na	
2200	2300	Canada, CFRX Toronto ON	6070na	
2200	2300	Canada, CFVP Calgary AB	6030na	
2200	2300	Canada, CKZN St John's NF	6160na	
2200	2300	Canada, CKZU Vancouver BC	6160na	
2200	2300	China, China Radio Intl	7175eu	9590as
2200	2300	Costa Rica, University Network	13750va	
2200	2300	Eqt Guinea, Radio Africa	15190af	
2200	2300	Guyana, Voice of 3291do		
2200	2300	Malaysia, RTM/Trax FM	7295as	
2200	2300	DRM New Zealand, Radio NZ Intl	13730pa	
2200	2300	New Zealand, Radio NZ Intl	15720pa	
2200	2300	Nigeria, Radio/Kaduna	4770do	6090al
2200	2300	Nigeria, Voice of/ Ext. Svc Lagos	7255af	
2200	2300	vi Papua New Guinea, Wantok R. Light	7325va	
2200	2300	vi Solomon Islands, SIBC	5020do	9545al
2200	2300	Taiwan, Radio Taiwan Intl	15600eu	
2200	2300	Turkey, Voice of 6195va		
2200	2300	UK, BBC World Service	5955as	5965as
		5975am	6195as	7105as
		12095af	13640am	15400af
2200	2300	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	
2200	2300	USA, KAIJ Dallas TX	9480va	
2200	2300	USA, KLTN Salt Lake City UT	15590na	
2200	2300	USA, Voice of America	7120va	9415as
		11725va	15185va	
2200	2300	mtwhf USA, WBCQ Monticello ME	5110am	17495am
2200	2300	USA, WBCQ Monticello ME	7415am	9330na
2200	2300	USA, WBOH Newport NC	5920am	
2200	2300	USA, WEWN Vandiver AL	9975na	15745eu
2200	2300	USA, WHRA Greenbush ME	11885na	
2200	2300	mtwhfa USA, WHRI Cypress Creek SC	9515am	
2200	2300	USA, WHRI Cypress Creek SC	11885am	
2200	2300	USA, WINB Red Lion PA	13570am	
2200	2300	USA, WRMI Miami FL	9955va	
2200	2300	USA, WTJC Newport NC	9370na	
2200	2300	USA, WWCR Nashville TN	7465na	9985na
		12160na	13845na	
2200	2300	USA, WWRB Manchester TN	6890va	9385va
		12180na	15250va	
2200	2300	Sat/Sun USA, WWRB Manchester TN	3185na	15250va

2200	2300	15250va		
2205	2230	USA, WYFR/Family Radio FL	9620af	11740na
2215	2230	Italy, RAI Italia	11895va	
2230	2257	Croatia, Croatian Radio	6165eu	9925eu
2230	2300	Czech Rep, Radio Prague	7345na	9415na
2230	2300	Guam, AWR/KSDA	15320as	
2230	2300	Papua New Guinea, NBC	9675do	
2230	2300	USA, Voice of America	9570va	11705va
		15145va		
2245	2300	India, All India Radio	9705as	9950as
		11620as	11645as	13605as

### 2200 UTC - 7PM EDT / 6PM CDT / 4PM PDT

2300	2300	Bulgaria, Radio	9700na	11700na
2300	2315	Nigeria, Radio/Kaduna	4770do	6090al
2300	2330	Australia, Radio Australia	9660as	12080as
		13620pa	13670pa	15230pa
		17785va	17795va	
2300	2330	USA, Voice of America	9570va	13755va
		15145va		
2300	2345	USA, WYFR/Family Radio FL	11740na	
2300	2345	DRM Vatican City, Vatican Radio	7370na	
2300	0000	Anguilla, University Network	6090am	
2300	0000	Australia, ABC NT Alice Springs	2310do	
		4835do		
2300	0000	Australia, ABC NT Katherine	5025do	
2300	0000	Australia, ABC NT Tennant Creek	4910do	
2300	0000	smtwhf Canada, CBC NQ SW Service	9625na	
2300	0000	Canada, CFRX Toronto ON	6070na	
2300	0000	Canada, CFVP Calgary AB	6030na	
2300	0000	Canada, CKZN St John's NF	6160na	
2300	0000	Canada, CKZU Vancouver BC	6160na	
2300	0000	China, China Radio Intl	5915as	5990va
		6145na	7180as	11685as
2300	0000	Costa Rica, University Network	13750va	
2300	0000	Cuba, Radio Havana	9550va	
2300	0000	Egypt, Radio Cairo	9460na	
2300	0000	Guyana, Voice of 3291do		
2300	0000	India, All India Radio	9705as	9950as
		11620as	11645as	13605as
2300	0000	Malaysia, RTM/Trax FM	7295as	
2300	0000	DRM New Zealand, Radio NZ Intl	13730pa	
2300	0000	New Zealand, Radio NZ Intl	15720pa	
2300	0000	Papua New Guinea, NBC	9675do	
2300	0000	vi Papua New Guinea, Wantok R. Light	7325va	
2300	0000	vi Singapore, MediaCorp Radio	6150do	
2300	0000	Solomon Islands, SIBC	5020do	9545al
2300	0000	UK, BBC World Service	3915as	5965as
		6195as	9740as	11945as
		12010as		
2300	0000	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb
		12133usb	13362usb	
2300	0000	USA, KAIJ Dallas TX	9480va	
2300	0000	USA, KLTN Salt Lake City UT	15590na	
2300	0000	USA, Voice of America	7120va	9415va
		11725va	15185va	
2300	0000	USA, WBCQ Monticello ME	5110na	7415am
		9330am	17495am	
2300	0000	USA, WBOH Newport NC	5920am	
2300	0000	USA, WEWN Vandiver AL	9975na	15745eu
2300	0000	USA, WHRA Greenbush ME	7520na	
2300	0000	Sun USA, WHRI Cypress Creek SC	7490am	
2300	0000	USA, WHRI Cypress Creek SC	7315am	
		7520am		
2300	0000	mtwhfa USA, WHRI Cypress Creek SC	9515am	
2300	0000	Sun USA, WHRI Cypress Creek SC	7490am	
2300	0000	USA, WINB Red Lion PA	9265am	
2300	0000	USA, WRMI Miami FL	9955va	
2300	0000	USA, WTJC Newport NC	9370na	
2300	0000	USA, WWCR Nashville TN	5070na	7465na
		9985na	13845na	
2300	0000	USA, WWRB Manchester TN	3185na	5050na
		6890na	15250va	
2300	0000	USA, WYFR/Family Radio FL	15255am	17750am
2305	0000	Canada, Radio Canada Intl	6100na	
2305	0000	Greece, Voice of 7475eu	9420eu	15650eu
2330	2358	Vietnam, Voice of 9840as	12020as	
2330	2359	DRM Sweden, Radio	9800na	
2330	0000	Australia, Radio Australia	9660as	12080as
		13620pa	13670pa	15415va
		17750va	17785va	17795va
2330	0000	Burma, Dem Voice of Burma	5955eu	
2330	0000	Lithuania, Radio Vilnius	9875na	
2330	0000	UK, BBC World Service	9580as	
2330	0000	USA, Voice of America	7350va	9570va
		13755va	15145va	



# More 380-400 MHz Trunk Systems

In last month's column we profiled some of the new National Capitol Region 380-400 MHz trunk systems that have been uncovered by radio monitors. But these aren't the only systems popping up across the country. The US Navy and Marine Corps are also getting in on the act. They are developing a large nationwide network of trunk radio systems in the 380-400 MHz frequency range. Based on material that is available in the public domain, I believe this network is known as the Enterprise LMR system.

Thanks to monitoring help by Mark and LauraQ in California, Robert Wyman here in the Southeast U.S., and Chris Parris, *MT Fed Files* columnist, we now have a clearer picture of this far flung network (presented below).

### DEPARTMENT OF DEFENSE

California/Florida/Georgia/Virginia/Washington  
 Enterprise LMR System  
 System: Project 25 Standard  
 System ID: 014c  
 P25 WACN: BEE00

For *MT* purposes only, I have assigned the following *arbitrary* site numbers for the various locations listed below. These are not official designations.

Sites beginning with 1 are Washington sites (USN/USMC Pacific NW).

Sites beginning with 2 are Washington sites (Fort Lewis WA).

Sites beginning with 3 are Southeast United States sites.

Sites beginning with 4 are Virginia sites.

Sites beginning with 5 are California sites.

### CALIFORNIA

CA-501 385.0125/395.0125c  
 385.2125/395.2125  
 385.8875/395.8875  
 386.1250/396.1250c  
 386.2750/396.2750  
 386.4250/396.4250  
 386.5750/396.5750  
 386.9375/396.9375  
 388.2375/398.2375

CA-502 388.3875/398.3875  
 388.5375/398.5375  
 388.7250/398.7250 [Los Angeles Area]  
 386.1000/396.1000c  
 386.2500/396.2500  
 386.4000/396.4000  
 386.5500/396.5500 386.8500/396.8500  
 388.0250/398.0250 [Los Angeles Area]  
 CA-503 386.0375/396.0375c  
 386.3375/396.3375c [Los Angeles Area]  
 CA-504 386.0125/396.0125c  
 386.6125/396.6125  
 386.7625/396.7625  
 388.0375/398.9375  
 388.2500/398.2500 [MCB Camp Pendleton/Pendleton MCAS]  
 CA-506 385.3500/395.3500c  
 385.9125/395.9125 [Escondido?]  
 CA-507 386.0625/396.0625c [Lake Elsinore]  
 CA-508 386.3750/396.3750c [Pleasant Peak]  
 Other frequencies reported: 386.6500/396.650

### FLORIDA/GEORGIA - SOUTHEAST US

FL-301 386.4500/396.4500c  
 386.1875/396.1875c  
 FL-302 386.4625/396.4625c  
 FL-303 386.4250/396.4250c [Eglin AFB]  
 FL-304 385.0125/395.0125c [Eglin AFB]  
 FL-305 385.0625/395.0625c  
 385.3500/305.3500  
 386.1375/396.1375  
 386.4125/396.4125  
 388.0250/398.0250  
 388.8875/398.8875 [Hurlburt Field]  
 FL-313 385.5625/395.5625c  
 386.2250/396.2250c [Mayport NS]  
 FL-315 386.2750/396.2750c [Kings Bay NS]  
 FL-316 380.4375/390.4375c [NAS Jacksonville]  
 FL-320 380.4625/390.4625c  
 FL-321 385.5125/395.5125c  
 Other frequencies reported: 385.0125/395.0125  
 385.0625/395.0625c  
 385.2125/395.2125  
 386.1875/396.1875  
 386.4250/396.4250c  
 386.4625/396.4625c

### VIRGINIA

VA-401 385.6750/395.6750c  
 386.4875/396.4875  
 386.7375/396.7375  
 387.5750/397.5750  
 387.9875/397.9875  
 389.3375/399.3375 [Camp Barnett]  
 VA-402 385.6250/395.6250c  
 386.4375/396.4375  
 386.9125/396.9125  
 387.9500/397.9500 [MCB Quantico]  
 VA-403 380.4875/390.4875c  
 381.2000/391.2000  
 381.3375/391.3375  
 381.6875/391.6875  
 381.8375/391.8375 [Pentagon]  
 VA-404 386.1125/396.1125c [Independence Hill]  
 VA-405 386.2500/396.2500c [Fredericksburg]

### PACIFIC NORTHWEST - WASHINGTON

U. S. Navy/Marine Corps System  
 WA-101 385.0625/395.0625c  
 WA-102 385.3125/395.3125c  
 385.9000/395.9000c  
 386.0125/396.0125  
 WA-103 386.1250/396.1250c

WA-104 386.1875/396.1875c  
 WA-105 385.3500/395.3500c  
 385.9125/395.9125c  
 386.0625/396.0625  
 386.6625/396.6625  
 386.8000/396.8000  
 WA-106 385.0125/395.0125  
 386.4125/396.4125c  
 386.6125/396.6125c  
 386.8125/386.8125  
 WA-107 386.3500/396.3500c  
 WA-108 385.8875/395.8875c  
 386.3375/396.3375c  
 386.6375/396.6375  
 WA-109 386.1000/396.1000c  
 WA-110 386.6750/396.6750c  
 386.8250/396.8250c  
 WA-111 386.0750/396.0750c  
 386.2250/396.2250c  
 WA-112 386.1625/396.1625c  
 386.7625/396.7625c  
 WA-114 385.8875c 386.0750c 386.1000c  
 386.3750 386.5500 386.6375  
 386.6750c 386.7000 388.0000  
 388.1500 [NAS Whidbey Island]

### U.S. Army System - Fort Lewis, Washington

WA-201 380.0750/390.0750c  
 380.1750/390.1750  
 380.2750/390.2750  
 380.3875/390.3875  
 380.4250/390.4250  
 380.5375/390.5375  
 380.5750/390.5750  
 380.8750/390.8750  
 380.9875/390.9875  
 381.0875/391.0875  
 381.1750/391.1750  
 381.2375/391.2375  
 381.3125/391.3125  
 381.4250/391.4250  
 381.6250/391.6250  
 381.8250/391.8250  
 381.8500/391.8500 [Fort Lewis]  
 WA-202 380.2125/390.2125  
 380.5500/390.5500  
 380.8375/390.8375  
 381.0125/391.0125  
 381.2875/391.2875 [Southside of Fort Lewis]  
 WA-203 380.7250/390.7250  
 WA-205 380.2750/390.2750  
 380.3875/390.3875  
 380.4250/390.4250  
 WA-207 380.2750/390.2750c [Yakima Firing Range Area]  
 WA-208 380.7250/390.7250c  
 380.9375/390.9375c [Yakima Firing Range]

### System Talkgroups:

23292 NAS Whidbey Military Police  
 23321 NB Kitsap Fire Department Dispatch  
 23322 NAS Whidbey Fire Dispatch  
 31502 MCB Camp Pendleton Telephone Maintenance (Oscar Units)  
 31504 MCB Camp Pendleton Telephone Maintenance (Oscar Units)  
 31506 MCB Camp Pendleton (Tango Units)  
 31515 MCB Camp Pendleton Electronics Maintenance (Romeo Units)  
 31971 MCB Camp Pendleton (Uniform Units)  
 32316 MCB Quantico Range  
 32317 MCB Quantico The Basic School  
 32424 MCB Quantico Airfield Operations (some



US Marine Corps service member using LMR radio (US Navy Photo)

encryption)  
 32801 MCB Quantico Range Control  
 32803 MCB Quantico Range  
 32901 MCB Quantico The Basic School  
 32902 MCB Quantico The Basic School  
 32903 MCB Quantico The Basic School  
 40111 Eglin AFB Fire Department  
 40112 Eglin AFB Crash  
 40113 Eglin AFB Fire Dispatch  
 40117 Eglin AFB Fire Department  
 40138 Eglin AFB Rescue/EMS  
 40147 Eglin AFB Security  
 40148 Eglin AFB Police  
 40152 Eglin AFB Security  
 40154 Eglin AFB Range Patrol  
 40184 Eglin AFB Fire Department  
 40237 Eglin AFB Test Control  
 40246 Eglin AFB Fuels  
 40248 Eglin AFB POL Refuel  
 40331 Eglin AFB Range Operations  
 40343 Eglin AFB Wolf Call  
 40400 Eglin AFB AGE  
 40510 Eglin AFB 46th MOC  
 40513 Eglin AFB Ground  
 40602 Eglin AFB Maintenance Center  
 42108 Hurlburt Field Tower/Ground  
 42200 Hurlburt Field Aircraft Maintenance  
 42201 Hurlburt Field Aircraft Maintenance  
 42202 Hurlburt Field Aircraft Maintenance  
 42203 Hurlburt Field Aircraft Maintenance  
 42205 Hurlburt Field Aircraft Maintenance  
 42206 Hurlburt Field Aircraft Maintenance  
 42207 Hurlburt Field Aircraft Maintenance  
 42208 Hurlburt Field Aircraft Maintenance  
 42209 Hurlburt Field Aircraft Maintenance  
 42210 Hurlburt Field Aircraft Maintenance  
 42211 Hurlburt Field Aircraft Maintenance Control  
 42212 Hurlburt Field Aircraft Maintenance  
 42214 Hurlburt Field Aircraft Maintenance  
 42308 Hurlburt Field POL Refuel  
 42310 Eglin AFB Range Operations  
 42313 Hurlburt Field Transportation  
 42315 Eglin AFB Unknown user/usage  
 42401 Hurlburt Field Security Forces  
 42412 Hurlburt Field Fire/Crash  
 42415 Hurlburt Field Fire Tac-1  
 42418 Hurlburt Field Fire Tac-3  
 42424 Hurlburt Field Billeting  
 42435 Eglin AFB Unknown user/usage  
 42433 Hurlburt Field Police <Channel 1>  
 42434 Hurlburt Field Police <Channel 2>  
 42440 Hurlburt Field Civil Engineering Control  
 42441 Hurlburt Field Civil Engineering Control  
 42442 Hurlburt Field Civil Engineering Control  
 42443 Hurlburt Field Civil Engineering Control  
 42444 Hurlburt Field HVAC  
 42445 Hurlburt Field Plumbing  
 42446 Eglin AFB Civil Engineers  
 42448 Hurlburt Field Housing Maintenance  
 42453 Eglin AFB Transportation  
 42623 Hurlburt Field ATOC

Based on open source information we now know that additional bases either have or will get an Enterprise LMR system. I would like to get field reports on any 380-400 MHz activity from anyone within range of the following bases: MCB Camp Lejeune, NC; MCAS Cherry Point, NC; MCAS Yuma, AZ; MCMWTC Bridgeport, CA; MCAGCC 29 Palms, CA; MCAS Beaufort, SC; MCRD Parris Island, SC; MCLB Albany, GA; Henderson Hall, VA; MCLB Barstow, CA; and Blount Island, FL.

I also have information that indicates that Fort Sill in Oklahoma is supposed to bring a 380-400 MHz online. And I am still looking for any reports from the Denver/Colorado Springs area on their new 380-400 MHz LMR system. You can reach me at the email address in the masthead.

## ❖ New London Submarine Base

MT's Chris Parris had a little time to survey the New London Submarine Base on the Thames River near Groton, CT, recently. Chris reports, "First off, they have a wonderful submarine museum near the front gate of the base that offers a picnic area and

a great view of the Security Zone on the Thames River."

Chris plugged in all the known reported VHF frequencies and says that there have been some changes to what has been published in lists for this area. He also searched out the 380-400 MHz and 406-420 MHz bands, but found nothing unusual there.

Here is what Chris found active:

138.8500	Civil Engineering repeater (CSQ)
138.9500	Data bursts, sounded like stuff he has heard listed as "Base Fire Alarm" data on some lists.(CSQ)
140.2250	Unknown user/usage (CSQ)
140.7000	Base Security repeater, lots of stations checking in with radio checks. (CSQ)
140.9500	Strange short tone sequences heard - unknown user. (CSQ)
142.3125	"Please call Pier Security by landline..." (114.8 Hz PL)
143.6000	Input to 140.7000 MHz repeater. (186.2 Hz PL)
162.1250	US Coast Guard Tactical (CSQ) <CC-9>
171.3625	Listed as being the US Coast Guard Academy, located just across the Mystic River from the sub base. (P25)
464.5500	Used at Nautilus Museum

## ❖ Westover JARB Update

An anonymous source passed along the following update for Westover.

138.0750	Repeater Law Enforcement Security Net #1? (Channel #1)
138.4250	Repeater Law Enforcement Security Net #2? (Channel #2)
148.4625	Input to the 138.0750 MHz repeater.
148.5375	Input to the 138.4250 MHz repeater.

## ❖ New Ohio Guard HF Frequency

Jack Metcalfe in Kentucky has found a new HF ALE frequency for the National Guard in Ohio. He monitored the ALE addresses ANGSPRINGFIELD and NGTROOPCMD on 2492.0 kHz USB. Thanks for the update, Jack.

## ❖ Milair Frequency Changes

Regular MT Milcom reporter Jack NeSmith checks in with a nice list of recent frequency changes in the military/civilian aeronautical bands.

Andrews AFB, MD (KADW)	251.500	Navy Operations
Barksdale AFB, LA (KBAD)	307.025	ATIS (New)
Cannon AFB, NM (KCVS)	311.000	Command Post (New)
	381.300	TOD Frequency (New)
Charleston AFB, SC (KCHS)	291.650	Clearance Delivery (ex-381.600 MHz)
Elmendorf AFB, AK (PAED)	128.800	Clearance Delivery
	306.925	Clearance Delivery
Fort Campbell/Sabre AHP, KY (KEOD)	49.700	Sabre Eagle Pre-flight (no longer used)
	265.500	Sabre Eagle Pre-flight (new)
Goodman AAF, KY (KFTK)	38.800	Range Control <Secondary>
	38.900	Range Control <Primary>
	133.350	Tower (ex-126.800 MHz)
Gray AAF, WA (KGRF)	120.100	Sea Approach (paired with 290.900 MHz)
	128.200	Final Approach - Civilian

139.925	Final Approach <Primary>	
239.000	Final Approach	
290.900	Sea Approach (paired with 120.100 MHz)	
317.400	Final Approach	
Hartsfield-Jackson Atlanta International (KATL)	133.425	Runway 10 and 28 ILS (ex-136.150 MHz)
Hurlburt Field, FL (KHRT)	351.675	Tower Local Control (ex-291.100 MHz)
Lakehurst NAES/Maxwell Field, NJ (KNEL)	307.025	Ground Control (New)
McCarran International, NV (KLAS)	125.900	Las Vegas Approach (ex-133.950 MHz)
	307.250	Las Vegas Approach (ex-353.700 MHz)
Los Alamitos AAF, NM (KSLI)	118.875	ATIS (New)
	379.975	ATIS (New)
Luke AFB, AZ (KLUF)	306.950	Clearance Delivery (ex-363.125 MHz)
	363.125	Approach Control-North <Channel 5> paired with 118.150 MHz
Marshall AAF, KS (KFRI)	139.000	Base Operations Flight Following <Primary>
	247.000	Base Operations Flight Following
Mayport NS, FL (KNRB)	267.600	ATIS (ex-268.600 MHz)
Mountain Home AFB, ID (KMUO)	285.650	Clearance Delivery (ex-373.000 MHz)
Pensacola NAS/Forrest Sherman Field (KNPA)	124.350	Clearance Delivery (New)
Randolph AFB, TX (KRND)	290.525	Randolph ATIS (New)
	271.800	Hangover ATIS (New)
Seattle ARTCC (KZSE)	134.950	Badger Mountain, WA RCAG Low/High Discrete
	270.300	Badger Mountain, WA RCAG Low/High Discrete
	353.900	Badger Mountain, WA RCAG Low/High Discrete
Tallahassee Regional, FL (KTLH)	128.625	RCAG (ex-135.325 MHz)
Tonopah Test Range, NV (KTNX)	257.950	Tower (New)
	335.500	Ground Control (New)
Travis AFB, CA (KSUU)	239.050	Ground Control (New)
USAF Academy Airstrip, CO (KAFF)	121.950	VHF PMSV Metro (no longer used)
	134.100	VHF West Tower (ex-121.250 MHz)
	376.000	UHF PMSV Metro (in service)
Vagabond AAF, WA (KFCT)	30.025	Rattlesnake VHF-Low frequency
	139.700	CTAF frequency
	363.250	Rattlesnake UHF frequency (ex-379.100 MHz)
Webster NOLF (St. Inigoes) (KNUI)	360.250	Secondary (ex-315.500 MHz)
Yuma MCAS/Yuma International, AZ (KYUM)	281.000	Departure Control <Primary>
	374.000	Approach Control <Primary>
Yuma Proving Ground, AZ (KLGf)	125.550	Approach/Departure Control (no longer used)

And that does it for this edition of MT's Milcom column. Until next time, 73 and good hunting.

## Washington DC – Federal Scanning Wonderland

Over the years that I have been able to travel across the country for work and bring my scanners with me, I have made several short trips through the nation's capital, Washington DC. This past June I was fortunate enough to have some spare time on one of these trips and decided to do some "serious" searching and scanning of the area.

This is one of these special places that scanner nuts just dream about. There is, realistically, almost too much to try and listen to at any one time! It seems that nearly every federal frequency allocation between 162 to 174 MHz has someone in the Washington DC area or nearby using it. The 406 to 420 MHz band is also filled with conventional and trunked systems all over the Maryland, Virginia, and the DC area. And to top all that off, the military land-mobile bands of 138-144 MHz, 148-150.75 MHz and 380 – 390 MHz were also hopping with activity. And who could overlook the military UHF aircraft operations in the area? All I can say is "Wow!"

Clearly, this trip was going to require some additional equipment, just as my trip earlier in the year to the Super Bowl in Miami. I again brought along my usual road radios, the PRO-96, 396 and 996 scanners. I also brought my Yupiteru MVT-7100 and my Sporty's JT-100 air band scanner. The Optoelectronics OptoCom receiver and laptop computer rounded out the gear.

Besides setting up automatic logging and recording at the hotel room base of operations, I also went mobile and did my best to search, scan and listen while driving. So what did I hear while in Washington? The log list is long, so I decided to try and break it up by agency:

### US CAPITOL POLICE

Freq MHz	HZ	Chan/Use
169.2250	110.9	F1 /F6
165.5375	146.2	F2/F7
170.1750	156.7	F3/F8
162.2500	173.8	F4/F9 - Security Details with motorcade ops
162.6125	127.3	F5/F10
I also copied some of the Capitol Police channels with alternate PI tones. These could be alternate repeaters or simplex use.		
165.5375	118.8	
169.2250	156.7	
170.1750	107.2	

### NATIONAL PARKS SERVICE

172.4750	P-25	NPS National Capitol Area - Parks Control?
166.7250	127.3	NPS US Park Police F1/F6

166.9250	127.3	NPS US Park Police F2/F7
167.0750	127.3	NPS US Park Police F3/F8
166.8500		NPS US Park Police F4

### JUSTICE DEPARTMENT

418.9500	P-25	DEA
167.2125	167.9	FBI
167.3625	167.9	FBI - This may be a repeater near National Cathedral. I got a "Close Call" trigger on this frequency while driving near there.
167.3875	167.9	FBI
167.4125	167.9	FBI - Clear surveillance operation heard over several days. May be called channel B7 or B8.
167.4625	167.9	FBI
167.4875	167.9	FBI
163.2000	136.5	US Marshals

### DEPARTMENT OF HOMELAND SECURITY

165.2375	100.0	DHS CBP Net 1
166.4625	CSQ	DHS Common
169.4500	100.0	DHS CBP
415.2000	P-25	DHS Federal Protective Service

### US SECRET SERVICE

162.0750	P-25	USSS UD (Uniformed Division) WH 1 [169.9375 in]
162.3125	P-25	USSS UD Foreign Missions 1 [171.7625 in]
163.0000	P-25	USSS
163.3125	P-25	USSS UD WH 2 [170.4375 in]
164.1000	P-25	USSS UD K-9 units
164.4000	P-25	USSS PAPA
164.4375	P-25	USSS UD Foreign Missions 2 [172.5625 in]
164.6500	P-25	USSS TANGO
164.8875	P-25	USSS OSCAR
165.2125	P-25	USSS MIKE
165.3750	P-25	USSS CHARLIE
165.4125	P-25	USSS ?
165.7875	P-25	USSS BAKER - Clear P25!
166.2000	P-25	USSS UD VP Residence
166.7000	P-25	WHCA NOVEMBER
167.0125	P-25	USSS VP Details
167.0375	P-25	USSS POTUS Details
167.9000	P-25	USSS
170.0000	P-25	USSS UD Admin / USSS Common
170.9875	P-25	USSS UD Foreign Missions 3 [Simplex]

### MISCELLANEOUS AND UNKNOWN AGENCIES

164.9125	127.3	National Arboretum
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406.3875		Unknown agency
406.5625	P-25	Unknown agency
407.6000	P-25	State Department Diplomatic Security Service
407.7750	P-25	US Postal Inspectors
407.8625	P-25	Unknown agency – clear / encrypted
408.1250		Library of Congress
408.5125	P-25	– security repeater
408.6000	P-25	Unknown agency, mentioned Federal Protective Service
408.8875	P-25	State Department Diplomatic Security Service
409.0375	P-25	Unknown agency
409.5125	D073	Unknown agency – analog repeater
409.7125	P-25	Unknown agency
409.9000		Paging data
410.1750		Unknown agency
410.6500		Unknown LTR system?
410.8250	D631	Unknown agency – analog repeater
410.9375	P-25	Unknown agency
411.5500	210.7	National Gallery of Art
411.9500		Unknown agency – analog
413.4500		Unknown agency – analog
414.7500	P-25	US Postal Inspectors
415.2250	156.7	Unknown agency – analog repeater
416.1500		Architect of the Capitol Alert System, "This is only a test..."
417.8875	P-25	Unknown agency
419.2500		Unknown agency – sounded like DES encryption

### ❖ Federal Trunk Systems

Besides the conventional radio systems in the DC area, there are quite a few federal trunk systems in operation. The first trunk systems in the DC area belonged to Department of Defense operations. In the last year, much of the DoD operations have begun to move off the 400 MHz trunk systems to the new DoD 380 MHz P-25 trunk systems.

There are several trunk systems for various federal agencies and facilities that are using the LTR Passport flavor of trunking. These systems cannot be tracked with the current models of scanners, but you can listen to them conventionally.



John F. Kennedy Center for the Performing Arts  
LTR Passport Trunk System  
408.45000

**Smithsonian Institution (National Zoo)**  
LTR Passport Trunk System  
408.45000  
409.42500

#### **Washington DC Area Federal**

LTR Passport Trunk System  
National Mall

407.0750  
407.3750  
408.5500  
408.8750  
410.3125

Udvar-Hazy Center (Dulles Airport)

406.5875  
409.8500  
410.9625

Unknown Location or Facility

406.5875  
409.8500  
410.9625

Unknown Location or Facility

406.1625  
409.8875  
410.6625

Some additional federal systems are Motorola Type II UHF trunking. Some are analog and some are using P-25 digital voice. This system was operated by the National Telecommunications and Information Administration (more on them later) as a “catch-all” for various federal agencies and may have been a temporary solution, as the system has very little traffic on it these days:

**Motorola System ID - 4e00 - Analog**

406.10000  
406.25000  
406.75000  
406.85000  
408.70000  
408.90000  
409.75000  
410.37500

This trunked system is widely believed to belong to the National Institutes of Health at various locations:

**Motorola System ID - 4732 - Analog**

409.0000  
410.2250  
410.4250  
411.4500  
411.8250  
413.4500

This system was reported at one time to be part of the National Institutes of Health in Maryland, but today it seems to have few users. The one transmission I caught from this system referred to someone at the Federal Trade Commission, possibly security at the FTC:

**Motorola System ID - bc0a - Analog**

406.4000  
409.2375  
409.5000  
409.8625  
410.1000  
410.6250

Many of the frequencies that were formerly used in the military's National Capitol

District 400 MHz trunk systems are now being integrated into a new, multi-site trunk system. This new system is reported by some sources to be a wide-area system for use by the Department of Homeland Security. So far not much is known for sure about this system or its users, as most radios are using encryption:

**Motorola System ID - a73b - P-25 digital voice**

406.11250, 406.36250, 406.52500,  
406.77500, 406.92500, 407.08750,  
407.23750, 407.41250, 407.56250,  
407.71250, 407.88750, 408.08750,  
408.26250, 408.42500, 408.57500,  
408.73750, 408.91250, 409.11250,  
409.27500, 409.47500, 409.63750,  
409.91250, 410.28750, 410.56250,  
410.76250

That's all I was able to log with the computer or write down while listening. I'm sure there were some that were missed and I'm sure the folks who live and monitor the Washington DC area full time can add to or correct the information that I have provided.

### ❖ **Encryption**

Many of the radio transmissions I monitored while in Washington DC were encrypted. As was expected, almost all the Secret Service frequencies were scrambled, but occasional clear traffic was heard, so don't give up. (Besides, I'm in it for the hunt for any active frequencies!) Clear traffic was also heard on the Federal Protective Service and FBI frequencies as well. But some of the UHF trunk systems using P-25 digital voice seemed to be using encryption on many, if not all the radios.

Remember that frequencies are not encrypted, talk-groups are not encrypted, systems are not encrypted – but individual radios are encrypted.

Encryption is much more “user-friendly” now than it has previously been. Users of digital radios, who are now getting used to the sound of the digitally processed speech, are not even aware of when a transmission is encrypted and when it's not. Some agencies have reportedly programmed the encryption to be turned on when any channel is selected automatically, so the chances of someone forgetting to “go secure” are much less likely.

### ❖ **Fed Files Myths and Legends:**

#### ***Feds can operate wherever they want***

One myth that continues to be spread by scanner listeners across the Internet is that federal agencies can use any frequency they want to transmit on. It may appear that way sometimes, as the FCC does not license federal frequencies, but federal agencies are assigned frequencies by a different government agency, the National Telecommunications and Information Administration or NTIA ([www.ntia.doc.gov/](http://www.ntia.doc.gov/)).

Part of the Commerce Department, the NTIA maintains all of the federal radio spec-

trum information in what is called the Government Master File, or GMF. This information is not available to the public any more, so that is why we federal monitors have to build our own databases of information from listener reports and personal logs.

Federal agencies cannot simply pick and use frequencies at random. Even though the FCC does not license them, they still must have authority to operate on assigned frequencies by the NTIA. The NTIA coordinates frequency requests from all federal agencies and makes sure agencies won't interfere with each other or existing users. The NTIA Office of Spectrum Management issues licenses, tracks down interference problems and complaints, and even issues citations for violating the rules.

Federal stations are issued call signs similar to FCC call signs, although federal stations are not required to broadcast those call signs. Some agencies, particularly US Forest Service stations, do use their NTIA call signs when transmitting. Many FBI offices use their NTIA call signs to identify themselves when calling agents in the field.

I have seen some frequency lists that report various federal agencies operating on frequencies between 138 and 150 MHz. This spectrum is under the control of the Department of Defense and would not normally be available for assignments to non-military federal operations. One listener reported that over a period of time years ago there was an ongoing surveillance operation on a 150 MHz channel that they presumed to be the DEA, due to some of the names and unit numbers being passed over the air.

If it really was the DEA, they could have been working along with some military investigative branch and they decided to utilize the military agency's VHF working frequencies for the operation. Or, perhaps the suspect in the case was wise to the DEA's UHF nationwide operating frequencies, and they decided to try and keep their communications out of the spotlight. In either case, the DEA would not have simply picked these frequencies out of the air and started using them on their own. It would require coordination between the DEA, NTIA and the DoD Spectrum Management Bureau.

So, what about federal agencies using local radio systems? Yes, they can and do use local public safety trunk systems sometimes, but they just don't show up there on their own. There will be a letter of agreement on file between whatever federal agencies are requesting space on the local system and the system operator. It will spell out the agreement for use and any restrictions or costs involved in using the system. The same goes for state police frequencies and radio systems. Often states will set aside special call signs or unit numbers for federal agencies to use.

That is all for this installment of the *Fed Files*, but we will be back in November!



## Denver, the Rockies, and Repeaters

Last time, we looked at the Powder River Basin (PRB) in Wyoming, and I listed some BNSF and Union Pacific frequencies used both in the PRB and in the Denver area.

My trips to and from the PRB have always been through Denver. Denver has the largest airport in that part of the country and therefore offers the widest range of rental vehicles. The Denver area itself (and nearby parts of Colorado) have much to offer to those interested in rail transportation and listening in on railroad operations.

Therefore, I usually plan at least a day at the beginning or end of the trip for locations in Colorado.

### ❖ Golden as a base

My overnight stays in the Denver region have usually been in nearby Golden, rather than downtown, both because motels are less expensive there and because that town provides convenient access to other sites that I'm interested in. Golden, best known for its huge Coors brewery – a major source of rail traffic, though the large yard at the brewery is fenced in – is also the home of the Colorado Railroad Museum, not far from the brewery.

(Coors plant switchers use the industrial UHF frequencies of 467.475 and 462.475, not standard AAR frequencies.)

The museum is worth a stop because of its strong collection focusing on Colorado narrow gauge and mountain railroading.



*The same eastbound Union Pacific train described above in a more wide-angle view. The loaded coal train from the Craig Branch in western Colorado has additional sets of locomotives in mid-train and at the end, all of which will help in dynamic braking on the way down to Denver.*

But one of my favorite parts of the area is further west, the Moffat Route's twisting climb to the 6.8-mile long Moffat Tunnel which gets trains through the Front Range of the Rocky Mountains. The East Portal of the tunnel (a named location on the railroad) is 9,239 feet above sea level, almost a mile higher than the mile-high city. And the tunnel replaces an even more tortuous route that initially went over the mountains.

East Portal can be reached via a reasonably good, though unpaved road, with a four-wheel drive vehicle suggested, though not absolutely necessary in dry weather.

### ❖ Moffat Tunnel

Besides its altitude and length, the tunnel has several other noteworthy features. The East Portal is equipped with a vertical metal door (also called the "curtain") and a huge assembly of giant fans used to drive exhaust fumes from the tunnel. When the fans are running, you can hear the roar up to a mile away.

After a westbound train has passed, the door is closed and fresh air forced in behind the door to vent fumes out the other end of the tunnel. It takes about half an hour to clear exhaust fumes, so the tunnel is a major choke point, allowing the passage of at most one train per half hour.

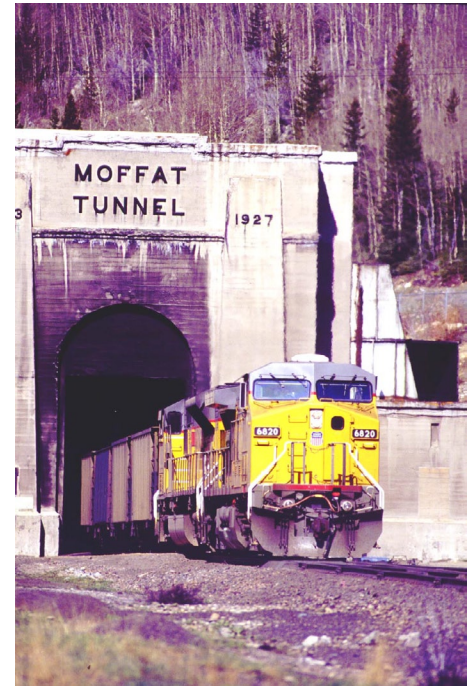
For eastbound trains, the fans are turned on as soon as the train has entered the west portal near Winter Park. The door remains closed until the train is very close, then opened for it to emerge.

There are both signals and defect detectors inside the tunnel. The signals are interlocked with the door, so that a train will not run into the closed door.

On that busy route, that leads to all sorts of dispatching challenges, all of which can be heard on a scanner. You'll see meets between trains exiting the tunnel and trains waiting to go through the tunnel.

The tunnel also has a repeater antenna running its full length, so that even outside the portal, you can clearly hear transmissions from within the tunnel.

Again, I'll put in plug for



*An eastbound Union Pacific train exits the East Portal of the Moffat Tunnel and begins its descent toward Denver. In this May 1999 photo, there are still patches of snow on the ground and yes, those are huge icicles on the tunnel portal.*

the applicable Altamont Press railfan timetable, in this case the *Rocky Mountain Region Timetable*, covering Colorado, Utah, and Nevada. Edition 7 was published in 2005. If you don't purchase one before getting to Colorado, you can pick up a copy at the Colorado Railroad Museum's shop in Golden or at Denver area rail hobby shops.

The timetable includes a good map of the route from downtown Denver – Denver Union Station is milepost 0; East Portal is at milepost 50.1, though the air distance from Denver is much less. The map includes the key roads that will get you to East Portal.

On the Moffat Route, now owned by Union Pacific, you'll see trains from UP (most of the traffic), Amtrak (The California Zephyr [CZ] in both directions), and BNSF. BNSF has trackage rights on the route and runs a small number of through freights. (The Grande Luxe excursion trains – formerly known as the American Orient Express – also show up on this route from time to time, usually scheduled to run immediately



behind the California Zephyr.) Under a new agreement between GrandLuxe and Amtrak, some runs of the CZ in late 2007 and early 2008 will have GrandLuxe cars tacked on the back, rather than operating as a separate train. (For details, see [www.grandluxerail.com](http://www.grandluxerail.com).)

It takes a lot of horsepower to get trains up the twisting route from Denver. Trains move slowly, usually making it possible to see or photograph them at one location and then to get ahead by road to another location on the line – not to mention that there are frequent meets during busy times.

Eastbound loaded coal trains originating on the Craig Branch in western Colorado will usually have three sets of engines. Supplementing the head-end power, remote-controlled units appear at mid-train and at the end.

In addition to the repeaters handling communications inside the tunnel, UP also uses some mountaintop UHF repeaters. If you program these into your scanner, you can often hear trains on those frequencies when the normal AAR channels which serve as input and output for the repeaters are blocked by the terrain.

PBX frequencies in use on the line are AAR 12 and 33 on the east side of the tunnel.

If you have more time, you may also want to consider a trip to the west side of the Moffat Route, including scenic Gore Canyon, which I described in a feature in the September 2004 issue of *Railfan & Railroad* magazine. However, you cannot easily get by car from East Portal to the west slope. For that, you have to return to westbound Interstate 70 near Golden and then proceed westbound through the Eisenhower Tunnel.

That route takes you past the Georgetown Loop Railroad, a surviving remnant of a mountain narrow gauge line with seasonal operations. The Georgetown Loop uses AAR channel 21/21 (160.425) for operations and AAR channel 67/67 (116.115) for administrative activities.

## ❖ Radio discipline

The military calls it “radio discipline” – adherence to the rules governing the use of radios. Messages are supposed to follow a particular format and non-business radio messages theoretically aren’t allowed.

Railroads have similar rules. Radios exist to conduct railroad business. Every message should include the identity of the sender and the identity of the recipient in some unambiguous format.

Consider, for example, the situation where several trains are switching in a yard, all using the same frequency. If someone transmits “Back up four cars” without proper identification and the wrong train reacts, disaster could result.

Private exchanges are prohibited, but railroads enforce that rule only to a degree. When two trains meet at a siding in an area with little rail traffic, it’s not unusual for the crews to exchange pleasantries if they know one another, which they usually do. And even the strictest supervisors don’t worry about that.

But, sometimes the most interesting conversations you hear on railroad frequencies are ones that don’t really belong there.

To me, one of the most puzzling – at least initially – was one I heard many years ago on



*A westbound BNSF trackage rights train on the west slope of the Moffat Route, descending through Gore Canyon, whose stark rocky terrain has often been compared to lunar landscapes. On this Union Pacific route, the BNSF train of course uses UP radio frequencies to communicate with other trains and the dispatcher.*

the former Clinchfield Railroad (now part of CSX) on the line that crosses the Blue Ridge Mountains in far western North Carolina. It went something like this:

**Conductor** (in the caboose): “11-9. Over.”

**Engineer**: “11-9. Out.”

**Conductor**: “13-11. Over.”

**Engineer**: “13-11. Out.”

The numbers kept changing. At first I thought the railroad had initiated some new type of code, such as the 10- system that police forces use. It wasn’t until I heard a message like this that I finally figured out what was going on:

**Conductor**: “Tennessee has taken the lead. 37-34. Over.”

The conductor had a personal transistor radio in the caboose and was listening to a basketball game on a slow Saturday afternoon – and relaying the scores to the engineer. It wasn’t exactly railroad business, but then there probably weren’t any supervisors around to complain.

## ❖ Same words, different meaning

After submitting the previous column, I had an interesting e-mail discussion with Managing Editor Rachel Baughn about how some words such as “signal” and “traffic” can have different meanings in the contexts of railroads and radio.

In the railroad world, “signal” usually means a visual lineside device from a traffic control system that displays one of several aspects telling trains to proceed, slow down, or stop. In the radio world, “signal” is the electromagnetic output of a radio transmitter.

“Traffic” to railroaders describes the number of trains on a line. To those in the radio world, “traffic” is the number of radio messages.

“Line” can either mean a railroad route or a physical wire circuit running along that railroad route.

Just to make things more interesting, in today’s world, radio signals are being increasingly used to operate railroad lineside signals. Look at older photos and you’ll find lineside poles with perhaps dozens of wires. These wires, in addition to carrying one or more circuits of

the railroad’s internal telephone system, mostly served as “code lines” – circuits that controlled the aspects displayed by signals and which reported track occupancy and switch positions back to the traffic control system.

Having up to thousands of miles of wire at trackside left railroads vulnerable to both the elements and thieves stealing the copper wires.

Today, the railroad’s internal telephone calls most likely go through a fiber optic cable that is buried along the right of way. Instructions to signals and the reporting of track occupancy and switch positions are handled by digital radio messages. In most cases, you’ll find next to most railroad signal locations a small metal housing for equipment supporting the signal system. And, an antenna will be nearby.

Equipment in the lineside metal boxes, sometimes called “bungalows” by railroad personnel, also processes track occupancy status and switch positions and sends that back by radio. The field equipment at the CTC (centralized traffic control) signal locations may communicate directly with a nearby larger base station tied into the traffic control system. That base station then communicates with the dispatching center either through fiber optic or microwave circuits. Or, the data can be relayed from bungalow to bungalow up and down the railroad route from a main point that is tied into the railroad’s traffic control system.

Needless to say, the use of common terms that can mean different things in the railroad and radio world can be confusing to those interested in both railroads and radio. I’ll try to be more aware of possible points of confusion and will try to make sure there is adequate context to show which meaning of a term is applicable.

Next time: Traveling on passenger trains with a scanner.

## Books by Ernest H. Robl:

*THE BASIC RAILFAN BOOK*

*UNDERSTANDING INTERMODAL*

*THE POWDER RIVER BASIN*

Detailed descriptions at

<http://www.robl.w1.com>

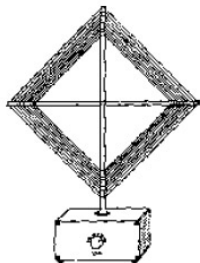


# LF Receiving Antennas: Loops

**M**ulti-turn Tuned Loops are another design worth discussing in this two-part series on LF receiving antennas. (Last month we covered random wire and ferrite loop antennas.) Multi-turn, tuned loops usually consist of a box-shaped frame wound with several turns of small diameter wire. The windings are tuned to resonance at LF with a variable capacitor connected across the windings. A separate, one-turn winding is placed in the middle of the tuned winding to provide a low impedance (50-100 ohm) "pickup link" used to feed the receiver via a coaxial cable.

Multi-turn loops are easy to build, and you can get plans for one by ordering a back issue of the September '92 edition of *Below 500 kHz* from *Monitoring Times* – cost \$3. (An optional preamp for this loop was published in the November '93 column.) Such a loop can be set on a tabletop and rotated to favor (or null) a particular signal. One *MT* reader I spoke with mounted his loop on an old music stand and is achieving excellent results.

A disadvantage of tuned loops is that they must typically be used indoors. Most designs are too fragile to mount outside in the wind, and even if you did, there is the problem of tuning. Whenever you move more than 10 kHz or so, the loop should be re-tuned for maximum performance. It is possible to employ remote tuning, but the arrangement can become very complicated. The good news is that these loops seem to perform very well indoors!



Finally, let's discuss **Broadband Shielded Loops**. These antennas have a number of advantages that make them popular with DXers – among them: low noise pickup, good sensitivity, tune-free operation and mechanical stability.

Shielded loops contain only one turn of wire, and, as the name indicates, they are electrically shielded, except for a very small portion (an inch or so) at the top of the loop circle. Shielding causes the loop to respond principally to the magnetic component of an incoming electromagnetic (RF) signal and reduces its susceptibility to electrical field noise.

Shielded loops typically contain a wide-band (10-500 kHz) preamplifier, so there's no need for tuning the antenna as you move across the band. In a well-designed loop, the

preamp begins "rolling off" above 400 kHz and becomes nearly "deaf" above 500 kHz. In this way, problems with AM broadcast overload are minimized.

Finally, shielded loops are made of a rigid or semi-rigid material such as copper pipe or "hardline" coax, so they can be easily mounted outdoors on a simple mast and turned with a TV rotor.

Would you like to build a shielded loop? If so, I highly recommend visiting VE3OT's web site at <http://technology.fanshawec.ca/eltn124/loops.htm>. Here, you'll find information for building several types of high performance loops. I'm currently building one of these myself.

An excellent general reference on loop antennas is Joe Carr's *Loop Antenna Handbook*, available from Universal Radio Research, 6830 Americana Parkway, Reynoldsburg, OH 43068. It contains over 130 pages of descriptions, plans and theory for many types of loop antennas.

## ❖ Loggings

As some of you may already know, I recently began serving as editor of the *DX Downstairs* column for the Longwave Club of America's *Lowdown* journal (see [www.lwca.org](http://www.lwca.org)). For years I have wanted to give something back to this respected publication, which has done so much to promote the longwave hobby since 1974. When the need for a column editor came up, I thought this would be one way in which I could contribute.

The *DX Downstairs* column is mainly devoted to reader loggings. To streamline the process and present the most interesting information, I plan to cross-post many of the logs I receive here, in the *DX Downstairs* column as well, and vice versa. If you object to your logs appearing in another venue, please let me know when you submit them and your wishes will be respected.

This month's loggings are provided courtesy of Lenroy Hogan (NY), Richard Palmer (AZ), Brent Taylor (PE), and Ken Reitz (VA). All contributors are identified by their initials and location in the list below.

### Selected LF Loggings

FREQ	ID	ST/ITU*	CITY	BY
198	DIW	NC	Dixon	KR-VA
206	QI	NS	Yarmouth	LH-NY
209	IB	ON	Atikokan	RP-AZ
214	CHX	MEX	Choix, Sinaloa	RP-AZ
216	CLB	NC	Carolina Beach	KR-VA, LH-NY

218	YUY	QC	Rouyn	LH-NY
219	GAV	AK	Gustavus	RP-AZ
220	BX	QC	Blanc Sablon	LH-NY
221	9A	AB	Hanna	RP-AZ
222	CUW	MEX	Chihuahua	RP-AZ
224	QM	NB	Moncton	BT-PE
233	ALJ	AK	Johnstone Point	RP-AZ
239	VO	QC	Val D'or	LH-NY
243	YVB	QC	Bonaventure	LH-NY
244	DG	QC	Chute Des Passes	LH-NY
248	UL	QC	Montreal	LH-NY
254	5B	PE	Summerside	BT-PE, LH-NY
257	YXR	ON	Earlton	LH-NY
260	NF	NFK	Norfolk Island	RP-AZ
260	YAT	ON	Wapisk	LH-NY
263	QY	NS	Sydney	BT-PE, LH-NY
270	FA	SMO	Upolo	RP-AZ
273	ZV	QC	Sept Iles	LH-NY
276	YHR	QC	Chevery	BT-PE, LH-NY
278	NM	QC	Matagami	LH-NY
280	IPA	PAQ	Easter Island	RP-AZ
283	DUT	AK	Dutch Harbor	RP-AZ
289	YLQ	QC	La Tuque	LH-NY
300	Q5	AB	Grande Cache	RP-AZ
302	XY	YT	Whitehorse	RP-AZ
303	YPP	QC	Parent	LH-NY
304	ZQM	NB	Riverview	BT-PE
323	UWP	NL	Argentia	LH-NY
326	FC	NB	Fredericton	BT-PE, LH-NY
332	POA	HI	Pahoa	RP-AZ
332	YFM	QC	La Grande	LH-NY
335	CC	CA	Concord	RP-AZ
335	YLD	ON	Chapleau	LH-NY
338	5Y	NS	Trenton	BT-PE
340	YY	QC	Mont Joli	LH-NY
341	DB	YT	Burwash Landing	RP-AZ
347	YG	PE	Charlottetown	BT-PE
350	DF	NL	Deer Lake	LH-NY
353	NH	MAR	Nuku Hiva	RP-AZ
360	PN	QC	Port Menier	BT-PE
366	YMW	QC	Maniwaki	KR-VA, LH-NY
366	ZMN	NB	Lewisville	BT-PE
370	GR	QC	Grindstone	BT-PE
375	FS	NT	Fort Simpson	RP-AZ
378	RJ	QC	Roberval	LH-NY
385	NA	QC	Natashquan	BT-PE
390	JT	NL	Stephenville	BT-PE
391	DDP	PR	San Juan	KR-VA, RP-AZ
395	XEN	OH	Xenia	KR-VA
397	ZHM	ON	Hamilton	KR-VA
400	ENS	MEX	Ensenada	RP-AZ
400	ZYG	PE	Cavendish	BT-PE
404	CKI	SC	Kingstree	KR-VA
407	CHD	AZ	Chandler	KR-VA
415	CBC	CYM	Cayman Brac	RP-AZ
419	RYS	MI	Grosse Ill	KR-VA
432	IZN	NC	Lincolnton	KR-VA

\* For a list of ITU codes, see [www.wordiq.com/definition/ITU\\_letter\\_codes](http://www.wordiq.com/definition/ITU_letter_codes)

## Cuban Spies Convicted

**A**lan Lutens forwards the link to a press release from the FBI from February 27, which largely escaped the notice of shortwave radio monitors. You can see the release for yourself at <http://miami.fbi.gov/dojpressrel/pressrel07/mm20070227.htm> Former Professor Carlos Alvarez of Florida International University was sentenced to 60 months in prison and his wife Elsa Alvarez received 36 months in prison after their convictions on charges that they were spies for Cuba between 1977 and 2005. The FBI said in this release,

"The electronic communications involved shortwave radio messages from the Cuban Intelligence Service, which Carlos Alvarez decrypted using a computer disk. Carlos Alvarez then gathered the requested information and compiled written reports, which he encrypted using another computer disk. Carlos Alvarez signed these reports with his codename, 'David.' Carlos Alvarez mailed these reports to various post office boxes in New York, and then burned in his backyard, and attempted to erase on his computer, evidence that the reports had been written.

"On occasion, Carlos Alvarez received new decryption and encryption computer disks from the Cuban Intelligence Service to ensure that the communications would remain secret. When Carlos Alvarez picked up the new computer disks, he sometimes transported them hidden in a portfolio or briefcase with a false compartment. Carlos Alvarez and his coconspirators ceased to communicate in this manner in or about 1998, after the arrest of the Wasp Spy Network in South Florida.

"Carlos Alvarez communicated with his coconspirators through personal meetings in Cuba and elsewhere. To this end, Alvarez's position as an educator at Florida International University enabled him to meet individuals on whom the Cuban Intelligence Service wanted information and to travel to Cuba to communicate his information."

This release from the FBI represents a clear description of the mechanism by which some of the "spy numbers" broadcasts on shortwave radio are utilized.

### ❖ Pirate Station Web Sites

DIY media operates a web site that contains an interesting collection of web sites operated by pirate stations, both on shortwave, medium wave, and FM. You can check out this interesting site at [www.diymedia.net/links/lstaus.htm](http://www.diymedia.net/links/lstaus.htm)

Another very interesting site operated by veteran DXer Chris Smolinski's Black Cat Systems web site contains a lengthy list of maildrop addresses used by various pirate broadcasters.

You can find that one at [www.blackcatsystems.com/pirate/stations/](http://www.blackcatsystems.com/pirate/stations/)

### ❖ British MPs Protest Police and Pirates

Several British members of Parliament, including Lynne Featherstone, member of Parliament in the northern London district of Hornsey Wood Green, have questioned Crimestoppers, a police advocacy organization in the UK. Allegedly, British pirate Bizm FM has been running ads for Crimestoppers. Featherstone started the protest after complaints from London Turkish Radio, a licensed Turkish language radio station in London. Crimestoppers has denied purchasing the ads on the Bizm FM pirate. Crimestoppers also asked Bizm FM to stop airing the ads, and they asked OFCOM (the British FCC) to investigate.

### ❖ Ethiopian Clandestine

Brend Trutenau, via BBCMS and DXplorer, points out that The Ethiopian People Patriotic Front (EPPF) claims to have started a weekly quasi-clandestine broadcast to Ethiopia on 7 June. With an ID of "Ye Arbenyoch Dimts" [The Voice of Patriots], their announced schedule is on Thursdays for an hour at 1600 UTC on 15260 kHz. Has anybody been hearing this new transmission? It could be audible in North America on this frequency.

### ❖ West Bank Pirate

The BBC reported in June that pirate radio rose to the attention of the Israeli cabinet. A Palestinian pirate station on the West Bank was interfering at times with radio communications at Ben Gurion International Airport. Israeli communications minister Ariel Attias said that he was taking steps to "eradicate" pirate radio stations. He claimed to have shut down fifty pirate stations this year. Some flights at the airport had been delayed as a precaution until the pirate was busted.

### ❖ Holidays

There are two major pirate holidays this month. Labor Day in the United States is one. The novelty "Talk Like A Pirate Day" is the second, set for September 19 this year. The former always leads to increased shortwave pirate activity. The latter has hit the mainstream press, and is likely to impact programming on commercial radio and television. They have a web site at [www.wikihow.com/Talk-Like-a-Pirate](http://www.wikihow.com/Talk-Like-a-Pirate)

### ❖ What We Are Hearing

*Monitoring Times* readers heard two dozen different pirate radio stations once again this month, despite high static levels during the summer. You can hear them, too, if you use some simple techniques. Pirate radio stations never use regularly announced schedules, but shortwave pirate broadcasting increases noticeably on weekends and major holidays such as Labor Day. You sometimes have to tune your dial up and down through the pirate radio band to find the stations, but more than 95% of all North American shortwave pirate broadcasts are heard on **6925 kHz**, plus or minus 30 or 40 kHz.

**Back Door Show-** Somebody has been playing classic rock music by The Doors with an ID or slogan "Back Door Show." (None)

**Captain Morgan-** This captain programs rock music and audio from the old *Twilight Zone* TV show. (None, says to send loggings to the Free Radio Network web site)

**Chicken Radio-** This new one has an intense focus on chickens, what else? They play chicken songs and they feature an ad for a movie called "Electric Amish Armageddon." (None)

**Grasscutter Radio-** Classic rock music is the fare heard here. They seldom discuss cutting grass. ([grasscutterrado@yahoo.com](mailto:grasscutterrado@yahoo.com))

**Ground Zero Radio-** Their format is mostly rock, Burt the Turtle's old civil defense propaganda film "duck and cover" is often heard among the rock tunes on this pirate. (Announces defunct Elkhorn, but also uses [gzrsw@yahoo.com](mailto:gzrsw@yahoo.com))

**MAC Shortwave-** Paul Star has one of the best replicas of the old top 40 AM hit format ever produced. He still uses variable frequencies such as 3275, 6850, and 6925 kHz. ([macshortwave@yahoo.com](mailto:macshortwave@yahoo.com))

**Northwoods Radio-** Their distinctive "loon call" interval signal precedes their rock music "from the Great Lakes." Recently they transmitted a genre theme show of ballads. ([northwoodsradio@yahoo.com](mailto:northwoodsradio@yahoo.com))

**Radio Cricket-** Here's another new one that we don't know much about yet. Classic rock is their format, and they include a news segment. (Unknown)

**Radio Free Euphoria-** Captain Ganja's veteran marijuana advocacy station is operated by a self-described "aging hippie." (Belfast)

**Radio First Termer-** This documentary about radio shows broadcast to USA troops during the Vietnam war still appears from time to time on the pirate bands. (None)

**Radio Jamba International-** This new station features novelty tunes and news parodies. The Kracker Radio web site at [www.krackerradio.bravehost.com/](http://www.krackerradio.bravehost.com/) suggests that this one may be associated with **Kracker Radio**. (none)

**Radio Moshiah & Redemption-** Also sometimes known as Lubivitcher Radio, this ultraconservative Jewish religious pirate showed up again this month on 1710 kHz. Their web site at [www.radiomoshiah.org/](http://www.radiomoshiah.org/), still announces future plans for shortwave, FM, and "other broadcast methods." (None announced, but the web site accepts financial donations)

**Radio 6X-** They are a relatively new rock oldies pirate, and they have sent out more than one broadcast.

*Continued on page 61*

## The Ham as Scannist

**N**ot too long ago, the editorial staff of *MT* forwarded me an e-mail from Jon KF7YN asking, "Since you are one of the original Scanner Scum ([www.scannerscum.com](http://www.scannerscum.com)), will you be doing any scanning articles?" Our Managing Editor Rachel KE4OPD added, "I'd like to hear the answer to his question, too!" Point taken: I hear and obey.

True enough, I have written quite a bit about scanning when I was the *Beginner's Corner* Contributing Editor for *MT*. I have touched on how scanning can augment ham activity, especially in emergency operations in *On the Ham Bands* columns in the past. I have also written for a number of club and commercial publications related to scanning over the years. But I guess it wouldn't hurt to unpack the subject again, given changes in technology and practice on both the amateur and VHF/UHF public service bands.

You don't have to go all that far back in the world of ham and scanner activity to remember the days when you could slap half a dozen crystals (remember crystals?) into a Bearcat III or IV and have all the information about the local environment that a ham or scannist could ever desire. Times have changed, folks! There are still a few places around the country where such a set-up would do you well, but most places, especially those subject to urban and suburban sprawl, require dozens, perhaps even hundreds of frequencies to stay on top of anything going on in your region. Further, since those dark days in September six short years ago, interagency cooperation and emergency planning for both hams and public servants have made the task of VHF/UHF monitoring a much more complex task.

Let's take a look at how any ham might go about using scanning to enhance amateur radio.

### ❖ Know Thyself

In my own ham shack, at any given time, I have at least two scanning receivers going, keeping track of the world around me. Sure, part of this is because I am, as Jon KF7YN points out, a somewhat noted scannist (sez so right on the web site), but I see similar set-ups in most ham shacks where the OM or YL is involved in local Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Service (RACES) activities.

Begin your decisions about blending amateur radio and scanning activities by looking at how you plan to get involved. For example, if you are mainly a ragchewing ham who talks on 2 meters to and from work, your main interest might simply be a bit more information about road conditions than you are likely to get in the 15 second blurb you hear on your local news broadcast station. You would be looking for whatever local public service, mainly police and roads departments would have to offer. You might also tune local fire stations as their missions can block transportation routes.

If you are more involved in assisting your local emergency management operations through your area RACES, ARES, or Skywarn organizations, you will want to touch base with the local hams and leadership to find out what specific frequencies they would want you to monitor to aid in operations.

I have become more involved in outdoor activities in recent years, taking ham radio along on mountain bike and kayak excursions. I make a point of getting to know the frequencies for park rangers and forest fire operations as well as those of public service authorities nearby where I am playing in the woods. If you are out and about during forest fire season, this information can save your life. When I am kayaking navigable rivers and bays, I like to keep one ear on the marine band, especially Channel 16, 156.800 MHz (International Safety, Distress and Calling) and Channel 68, 156.425 MHz (commonly used for local talk in the boating world) just to know what is going on around me.

Most modern scanners provide access to the to the National Oceanic and Atmospheric Administration (NOAA) weather broadcasts. Many even allow you to enter National Weather Specific Area Message Encoding (SAME) information for local weather alerts. No matter what your area of interest, knowing local weather and weather safety information is a necessity.

Beyond the practical reasons for adding a scanner to your ham shack, it should not be forgotten that scanner monitoring is a ton

of fun. With this in mind, I have often suggested that a scannist can begin to see local listening opportunities by taking a map and a drafting compass and drawing concentric circles out every 5 miles from his or her primary station location out to about 25 miles. With this visual tool, it is easy to see what frequencies you need to track down.

What are the towns, cities, municipalities within your listening area? Are there any major industries, shopping malls or public gathering spaces such as sports arenas? How about airports, train routes or navigable waterways? Are there any military installations? How about local, state or federal facilities such as prisons? What about hospitals?

Get the picture? The number of scannable entities rapidly multiplies once you give an area a good going over. And we haven't even mentioned area business band listening opportunities. I know more about what is going on in my town listening to area construction contractor crews than I get from my home town police force. These folks know the real deal.

You can also use scanning to directly enjoy amateur radio. I have talked many times in this column about the dearth of activity on many local repeater systems. No doubt you have noticed the same problem in your area. I keep all the repeaters within range of my shack in one bank on one of my scanners. I regularly let this run. Every evening a couple of these local machines will become active with a few hams ragchewing. I have no problem inserting myself into these conversations and making new friends along the way. The more hams that take time to blow the dust of their 2 meter mics and get these machines active, the better. You may want to give this a try as well.

Don't forget that most scanning receivers will do some level of frequency finding on your behalf. Not everything you can easily hear will show up on common frequency lists. Also, new stuff is always popping up. If your scanner has the capability to perform searches, pay special attention to that section of the manual. Make use of any search and store functions periodically to discover new and often important listening opportunities.

### ❖ Know Your Frequencies

I always hear folks carping about how the Internet has "killed the radio hobby." Well, in the scanning world, the internet has made the hobby better than ever. How, you ask? By making multiple sources of frequency informa-



*Scanning receivers such as the Bearcat BCD396T Digital Trunking Scanner are great ways to enhance and support the amateur radio experience.*



tion easily available to any interested party. A general search as simple as "(your state, county or town) scanner frequencies" will no doubt bring up a great deal of basic information. Further research can be done at the FCC database <http://svartifoss2.fcc.gov/reports7/> or at many other sites such as [www.strongsignals.net/](http://www.strongsignals.net/) and [www.radioreference.com/](http://www.radioreference.com/)

In addition to these major players, many dedicated local scannists may be providing support for your region, either through websites or by way of online newsgroups. My region is very well served by the "PhillyScanner" group on Yahoo groups <http://groups.yahoo.com/group/PhillyScanner/>. Your area may have something similar. A few keystrokes should turn up tons of useful frequency information.

## ❖ Know Your Local Systems

Once you have made some decisions about what you want to listen to, it is important to do a bit more research before you head out to purchase a scanning receiver. The main reason for this is the growing use of trunked radio systems in many regions. Simply put, trunking systems allow many users to operate on a limited number of frequencies – a major aid to crowded bands in crowded metropolitan areas.

The only problem is, no one scanner is capable of receiving every type of trunked radio system. Sadly, there are even a few systems that cannot be monitored at all with the current crop of scanning receivers. Part of the reason I have those two scanners running in the background as I write this article is that I have three separate types of trunked systems active in the range of my antennas: Motorola, EDACS and LTR.

If you are dealing with trunked systems in your area, make sure you find a scanner that is compatible with your needs. Likewise, make note of any other possible special areas of interest. For instance, not all scanners cover the military air band. If you have any local military activity, you may want to have access to this band of frequencies.

## ❖ Know Your Equipment

Again, for all the reasons mentioned above, give a lot of thought to the scanning receiver you buy and really look at its manual to determine its true capabilities and how it will work in the part of the world where you live, work and play. If you are the owner of a scanner that has been rendered obsolete by area systems going to a trunked system, do not fret. While some of the systems you will be interested in will be trunked, there will still be plenty of traditional frequencies. This older scanner may still be used to cover these non-trunked frequencies.

Also, with this in mind, you may want to think about the wideband receiver capabilities of some of the ham radio handhelds. While none of these rigs have the same level of performance as a dedicated scanner, and to date none has the ability to automatically follow trunked system traffic, they make a great choice for anyone who can get the signals they want without worrying about a bunch of radios pulling their pants down as they walk.

## ❖ Know Your Power Needs and More

I am throwing this in as a general consideration. Regardless of your radio hobby needs, you always have to keep one eye on issues of power compatibility. I bring this up in relation to both scanners and handheld ham gear. You have to make the choice between equipment that may require custom battery packs or to try to go with equipment that allows the use of common double or triple "A" cells. I choose to look for gear that does the latter, because, in a pinch, I can always pop out the drained rechargeable cells I use and replace them with off the shelf alkaline cells that can be found in any convenience store. I also look for equipment that can be powered off of the standard 13.8 VDC power found in most motor vehicles, at least by way of a plug-in adapter.

I always carry a small "go bag" with spare cells and any additional accessories that can enhance the monitoring and operating experience. One accessory I have come to see as essential in recent years is a good (and compatible) set of headphones. Speaking for myself, I just ain't getting any younger, and my ears have been ringing since sitting on top of any number of amp stacks at numerous rock concerts in the '60s. (Then there were those years of racing motorcycles with open pipes. But I digress...) I need lots of help in hearing and headphones do the trick. Most modern scanners work great with common personal audio headphone systems that can be found in many electronics stores.

The more ways you can find to keep your radios going when the going gets tough, the better off you are going to be. And in those tough times, being able to listen in on the local world around you will be very important. At all other times, scanning is just fun – sort of like ham radio.

I'll see you on the bottom end of 40 meters.

### UNCLE SKIP'S CONTEST CALENDAR

**ARRL September VHF QSO Party**  
Sept 8 1800 UTC - Sept 10 0300 UTC

**North American Sprint, CW**  
Sept 9 0000 UTC - 0400 UTC

**Tennessee QSO Party**  
Sept 9 1800 UTC - Sept 10 0100 UTC

**YLRL Howdy Days**  
Sept 11 1400 UTC - Sept 13 0200 UTC

**QCWA QSO Party**  
Sept 15 1800 UTC - Sept 16 1800 UTC

**Washington State Salmon Run**  
Sept 15 1600 UTC - Sept 16 0700 UTC  
Sept 16 1600 UTC - 2400 UTC

**North American Sprint, SSB**  
Sept 16 0000 UTC - 0400 UTC

**Texas QSO Party**  
Sept 29 1400 UTC - Sept 30 0200 UTC  
Sept 30 1400 UTC - 2000 UTC

**CQ Worldwide DX Contest (RTTY)**  
Sept 29 0000 UTC - Sept 30 2400 UTC

## Outer Limits continued from Page 59

(Still Unknown)

**Sunshine Radio-** Their classic rock music is still hosted by a female announcer, in association with **Grasscutter Radio**. ([sunshineradio@yahoo.com](mailto:sunshineradio@yahoo.com))

**The Crystal Ship-** "The Poet produces the "Voice of the Blue States Republic" with left wing political commentary and rock music on randomly selected frequencies including 1710, 3346, 3275, 5386, 6875, 6925, 7576, and 9057 kHz. The station has been around for decades. (Belfast and [tcshortwave@yahoo.com](mailto:tcshortwave@yahoo.com))

**Undercover Radio-** Dr. Benway's rock music "from the middle of nowhere" comes from a self-announced fixed location and occasionally from a mobile transmitter. (Merlin and [undercoverradio@mail.com](mailto:undercoverradio@mail.com))

**Voice of Captain Ron Shortwave-** Another Captain is frequently active on the pirate bands with rock music. ([captainron6955@hotmail.com](mailto:captainron6955@hotmail.com))

**WBNY-** Commander Bunny's Radio Bunny still is the main clandestine parody voice of the Rodent revolution and monkey Freedom Fighters. Normally he is in upper sideband, but sometimes he transmits in slow scan TV mode. His fight against the Free Radio Network web site may have been resolved. (Belfast)

**WHOT-** Somebody has been relaying old shows from this ancient New York City rock music pirate hosted by Pete Sake and Jim Nasium. (None)

**WMPR-** If you hear techno rock "dance music" on the pirate bands, it is usually this veteran station. (None, QSLs only rarely at the Kulpville Winter Shortwave Listeners Festival).

**WNSR-** This newcomer programs rock oldies featuring lyrics about the days of the week, such as "Monday, Monday" and "Friday on My Mind." (None)

**Wolverine Radio-** This relative newcomer to the pirate bands has been broadcasting classic rock tunes. (Still Unknown)

**WSKO-** Early speculation is that this may be new call letters for Psycho Radio, who has returned with rock music. Sometimes they use 6875 kHz in lieu of 6925 kHz. ([syckoradio@yahoo.com](mailto:syckoradio@yahoo.com))

**WTCR-** Using a MGM movie trumpet fanfare interval signal, Dr. Morbius at "Twentieth Century Radio," spins classic rock music on his programs. (Belfast)

## ❖ QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. The cash defrays postage for mail forwarding and a souvenir QSL to your mailbox. Letters go to these addresses, identified above in parentheses: PO Box 1, Belfast, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; Casilla 159, Santiago 14, Chile; and PO Box 293, Merlin, Ontario N0P 1W0. Unfortunately, PO Box 69, Elkhorn, NE 68022 is announced as a no longer valid address, although a few pirates announce it, and some claim to still be getting replies through it.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. The best bulletin for submitting pirate loggings with a hope that pirates might QSL is now the e-mailed Free Radio Weekly newsletter, still free to contributors via [Elnsinge@vrxus.NJ.com](mailto:Elnsinge@vrxus.NJ.com). A few pirates will sometimes QSL reports left on the outstanding Free Radio Network web site, at [www.frn.net](http://www.frn.net) on the internet. Unfortunately, given the demise of *The ACE*, that formerly widely read bulletin can no longer be used in order to notify pirates that a listener heard a broadcast.

## ❖ Thanks

Your loggings and news about unlicensed broadcasting stations are always welcome via 7540 Highway 64 W, Brass-town, NC 28902, or via the e-mail address atop the column. We thank this month's valuable contributors: Skip Arey, Beverly, NJ; John T. Arthur, Belfast, NY; Kirk Baxter, North Canton, OH; Jerry Berg, Lexington, MA; Artie Bigley, Columbus, OH; Ross Comeau, Andover, MA; Richard Cuff, Allentown, PA; Gerry Dexter, Lake Geneva, WI; Rich D'Angelo, Wyomissing, PA; John Figliozzi, Halfmoon, NY; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; Harry Helms, Smithville, TX; Ed Insinger, Summit, NJ; Ed Kusalik, Coaldale, Alberta; Chris Lobdell, Tewksbury, MA; Allen Lutins, Johnson City, NY; Greg Majewski, Oakdale, CT; A. J. Michaels, Blue Ridge Summit, PA; Joe Miller, Troy, MI; John Poet, Belfast, NY; Chuck Rippe, Chesapeake, VA; Martin Schoech, Eisenach, Germany; Lee Silvi, Mentor, OH; Bryan Wade, Elizabethtown, KY; Joe Wood, Greenback, TN, and one anonymous contributor.

## A Simple, Wide-Band, Field-Strength Meter

In its pioneering days radio was called "wireless." The wireless transmitters were powered by an induction coil. When the high voltage from this coil produced sparks across a "spark gap" connected to the coil, the wireless waves (radio waves) were produced.

Crystal-set receivers were almost equally as simple as the spark-coil transmitters. They used a bit of crystal such as lead ore (galena) to detect the wireless waves. Connecting the crystal in a circuit with little more than an antenna, coil of wire, and headphones allowed reception of the raspy-voiced Morse code messages sent by the spark-coil transmitters. Today, the diode detector circuit in many modern receivers is essentially a bare-bones crystal-receiving set. Surprising as it may be, this, and much other history, is hiding inside most every modern radio receiver we have around today.

### ❖ Field-Strength Meters

Now let's consider a crystal receiver of a kind that serves in many contemporary two-way radio installations: a field-strength meter (FSM). An FSM is used as an indicator of the relative strength of radiation from an antenna. This includes antennas such as mobile whips,

adjustable coil-loaded whips, antennas with tunable traps, adjustable telescoping whip antennas on hand-held transceivers, and others.

### ❖ To Tune or Not to Tune

Some FSMs tune to the specific frequency of the signal being checked. On others, like the one described below, there is no provision for tuning. This circuit responds to signals from the low-frequency band, or even lower, on up to 500 MHz, and even higher. Mine worked well at 450 MHz, which was as high as I had equipment to test it.

A down side to the untuned design makes itself known when there is more than one radio frequency signal present at the FSM's antenna with sufficient strength to cause an indication on the meter. In that case, you would get an indication of the combined strength of the signals. However, this is almost never a problem because the sensitivity of the FSM is far less than that of an ordinary receiver, and typically only signals from antennas which are within a matter of feet from the FSM will cause a reading on the meter.

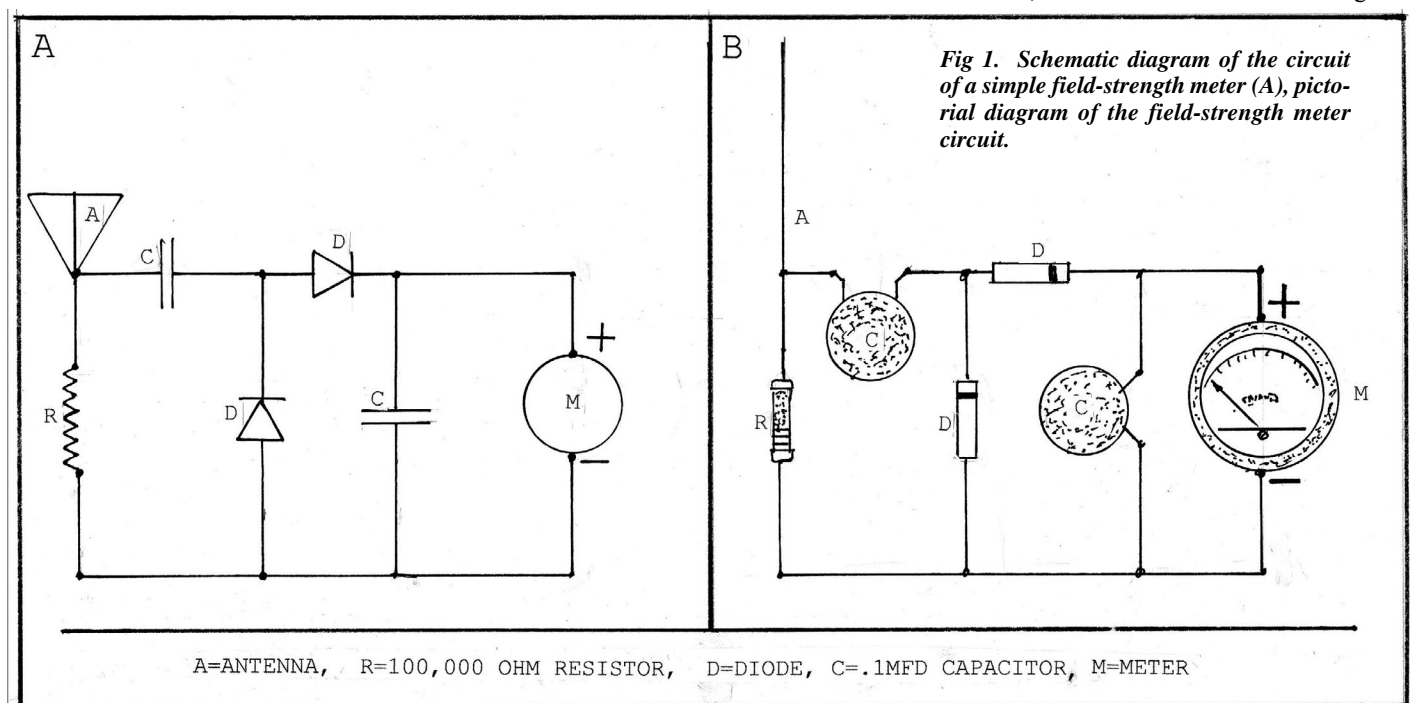
### ❖ Let's Build One

Fig. 1A shows the schematic diagram of the FSM. Those not familiar with reading

schematics will be able to follow the pictorial diagram of fig. 1B easier than that of fig. 1A. Keep all lead connections as short as is practical. You can make the connections by twisting the conductors together tightly, but it is best to solder connections. If you do solder, hold the leads from the diodes with a long-nosed pliers placed between the soldering iron and the diode. This reduces the heat transferred to the diode and makes heat less likely to damage the diode. Typically the diodes take the heat of soldering without damage.

The largest component of the FSM is the meter movement, and the FSM can be built to be scarcely larger than the meter movement itself. You can build the FSM without a case by attaching the circuit to the meter's terminals. On the other hand, it protects the circuit from damage if you put it in a small case.

For the crystal detectors I used germanium diodes. Examples of these diodes have part numbers: 1N34, 1N34A, and 1N60. Small-signal silicon diodes can be used, but they are much less sensitive than the germaniums. Contrary to things I've read, the Schottky diodes that I tried performed very poorly compared to germanium. I'd recommend germanium diodes if you can get them. Connect the diodes with the printed band, or bands, on one end of the diode as in fig. 1B.



#### This Month's Interesting Antenna-Related Web site:

Another simple FSM  
[www.zen22142.zen.co.uk/Circuits/rf/sfsm.htm](http://www.zen22142.zen.co.uk/Circuits/rf/sfsm.htm)  
An FSM with bar-graph indicator:  
<http://geocities.com/ajpotts19/wavemeter.html>  
If you're an ARRL member, click on "Learning to use Field-Strength Meters" at:  
[www.arrl.org/tis/info/using-equip.html](http://www.arrl.org/tis/info/using-equip.html)  
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A tutorial on germanium diodes:  
[www.americanmicrosemi.com/tutorials/germanium-diodes.htm](http://www.americanmicrosemi.com/tutorials/germanium-diodes.htm)  
Much antenna information kindly provided by Ian C. Purdie, VK2TIP is found at:  
[www.electronics-tutorials.com/antennas/antenna-basics.htm](http://www.electronics-tutorials.com/antennas/antenna-basics.htm)

The meter movement's full-scale current sensitivity can be any low value from 50 microamperes up to one milliampere full scale. Remember that the lower the full-scale current sensitivity, the better the FSM responds to weak signals, so you'll probably want to use the meter with the lowest full-scale sensitivity that you have available. Connect the meter's + (positive) and - (negative) as shown in the diagrams.

You can use a digital or analog multimeter rather than a meter movement if the multimeter has a sufficiently-low current range. This is done in the first *Antenna-Related Web Site* above. Just connect the multimeter's test leads in place of the meter movement in the circuit of fig. 1, and set the multimeter to its lowest current range.

The antenna can be several inches of stiff wire, a telescoping whip antenna, or a metal rod. A telescoping whip is handy when you have stronger signals, because shortening its length will lower the meter's sensitivity.

### ❖ Using the Field-Strength Meter

The response of the FSM can be adjusted by changing its antenna length, or by moving the FSM closer to or farther from the transmitting antenna. You will also note a significant effect of antenna polarization on the FSM's response. That is, for the largest indication on the meter, the orientation (vertical, horizontal, etc.) of the FSM's antenna must match the orientation of the antenna under test. And remember that your presence near the transmitting antenna under test will de-tune it somewhat, so do your measurement as far from the antenna as is practical.

### ❖ Getting Parts

Many of us acquire a goodly supply of electronic components by removing parts from defunct electronic equipment. As of this writing Dan's Small Parts and Kits: [www.danssmallpart-sandkits.net/](http://www.danssmallpart-sandkits.net/) had 0-200 ua meter, capacitors, resistors, Schottky diodes, germanium diodes and silicon diodes: all for good prices. Radio Shack had resistors, capacitors and silicon switching diodes. If you do a web search with the phrase "electronic parts" you'll find lots of electronic supply sources.

## RADIO RIDDLES

### Last Month:

I asked: "Lightning affects more than safety in radio work. As mentioned in the answer above, increasing antenna gain is of little value for improving reception at some frequencies, but at other frequencies it can improve reception significantly. What does the occurrence of lightning around the earth have to do with this?"

Well, the occurrence of a lightning bolt creates radio waves that can propagate thousands of miles around the earth, just as other radio waves in the same frequency range do. These unwanted signals are received as noise (static) by our receivers. From the upper portion of the HF band on down far into the lowest frequencies, the presence of this noise is usually greater than the noise generated inside the circuits of our receivers. So the lightning-produced noise dominates the signal-to-noise ratio in the receiver at those frequencies. Increasing antenna gain increases the received noise as much as it increases the desired received-signal's strength. So reception isn't improved.

At higher frequencies, usually from the upper portion of the HF band and above, very-little lightning-produced noise is received. And so the receiver's own internally-generated noise becomes the noise of concern. In this case, increasing the desired received-signal's strength with increased antenna gain increases that signal's strength, but the strength of the major source of noise (internal receiver noise) does not increase with increased antenna gain, and so reception improves.

### This Month:

The FSM described here is essentially a crystal-set receiver. If so, then how is the FSM of fig. 1 different from an ordinary crystal-set receiver we might use to listen to radio programs, and what would it take to make it into such a receiver?

You'll find an answer to this month's riddle, another riddle, another antenna-related web site or so, and much more, in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

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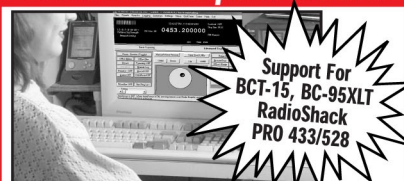
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## The BC-348 Restoration Continues

### ❖ From the Readers

Our first request for one of the Lindsay books (see box in August issue) comes from Reid Eisenhauer of Moncton, New Brunswick, Canada.

Health problems keep him at home, so he fills his time with his stamp collection and radio hobbies. One of Reid's first projects was a Radio Shack AM radio kit. This was followed up with a CB radio receiver kit that really got him hooked on radio. The first time he used it, he was able to pick up skip from a long way off.



*Reid Eisenhauer's hobbies include computers, SWLing and, now, tube radios.*

Later, computers became his main interest, but he continued SWLing and also built some crystal radios from the Lindsay book, *Radios That Work For Free*. Lately Reid has developed an interest in tube radios, and is beginning to read up on them – which led him to become a reader of this column. A ham friend is encouraging him to study for his amateur license, and he hopes to get on the air soon, preferably using tube gear.

I have more Lindsay books to give away, so don't be shy. Send me a pic, a couple of paragraphs about you and your hobby activities, and your address – and see what you get from the grab bag!

Bobby, K4VE, writes that he recently bought two BC-348s from a person who is downsizing his collection, so is now avidly following this restoration series. Joe Erickson, N8PMF, also recently purchased two BC-348s and is following our series with interest. One is an -R and one a -Q, so he has examples of each of the basic versions of this set.

Both of his radios were missing nameplates, so Joe had some replacements made at a trophy shop. Right now, he is busy backing out owner mods – and has found a wealth of information on the internet. If you haven't done it yet, just Google BC-348 and see what turns up.

### ❖ Checking Resistors

Last month, we changed out all of the paper capacitors in our BC-348 – including the one hiding in the c.w. oscillator can. It wasn't possible to take care of that one without removing the can from the radio – a job that turned out to be a bit of a bear. This month's work session began with putting the can back together and reinstalling the radio.

I hope I don't have to take it out again! I recently read of a BC-348 restorer whose c.w.o. refused to work until he had replaced a mica capacitor in the can. I hadn't thought of doing that while I had the can open since mica caps so rarely go bad.

With the paper caps taken care of, I turned my attention to the resistors. One BC-348 restorer wrote that he had become suspicious of his resistors when he came across one that

seemed to have spontaneously snapped in half. After doing some checking, he found that most of the others were seriously out of spec. (With age, some carbon resistors will significantly increase in value.)

I thought I had better look into the condition of the resistors in my set – keeping my fingers crossed. After replacing all the caps, I certainly wasn't looking forward to wholesale resistor replacement. Of course it isn't possible to measure the true value of a resistor without removing it from the associated circuitry; in circuit, it can be shunted by other components. But I used a practical technique recommended by a friend.

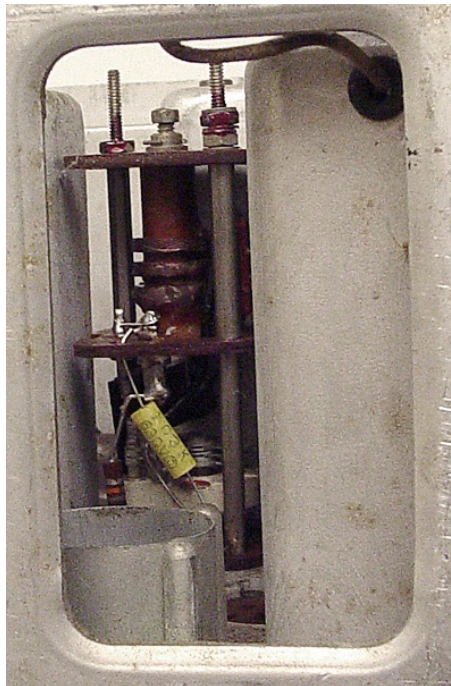
One checks each resistor without removing it from the circuit. If the resistance reads way too high, it definitely needs to be replaced. If the resistance is significantly lower than specs, this resistor is probably being bypassed by other components. Ignore it for now, but keep it in mind for later checking if the radio doesn't behave after being powered up. Actually, all of my resistors read very close to their marked values – so I began to have some confidence in their condition.

### ❖ Front Panel Installation

I had removed the front panel of this radio back in July and done a little cosmetic work on it. After washing with Murphy's Oil Soap, I used Q-tips and rubbing alcohol to get rid of most of the red crayon someone had used to outline under the bottom of the tuning dial bezel. After that the panel looked better, but the crackle finish was still dull and lifeless. I did make a major improvement in the looks of the ID plate by coating it with gloss varnish before temporarily setting the panel aside.

Now it was time to complete the job so that I could reinstall the panel on the set. Writing in the January 2007 issue of *The AWA Journal* (Quarterly Bulletin of The Antique Wireless Association), Lane Upton recommends the use of WD-40 lubricant for restoring a crackle finish or other painted surface.

The lubricant is simply sprayed onto a cloth (Turkish toweling material recommended) and applied thickly to the surface. After sitting for five minutes, the excess is removed with paper towels. Then more Turkish toweling is used to polish the remainder into the finish. After this treatment, Lane recommends that the piece be allowed to sit for 24 hours, after which it can be handled without leaving fingerprints.



*Peeking between a couple of shield cans at the opened c.w. oscillator gives us a view of the replaced paper capacitor.*



*Thanks to its front-panel face lift, our BC-348 is beginning to look quite sharp – even without its control knobs.*

I used this quick-and-dirty technique on my panel with very satisfactory results. The overall color has deepened and the white finish on the raised lettering now stands out much more vividly. But I can't say that the crisp texture of the original crackle finish (still visible in the protected area under the dial bezel) was restored. And there is a little more sheen in some areas than others. However, this set had been stored under less-than-ideal conditions for some time and I suspect that the weathering on the finish is irreversible.

The re-installation of the front panel took a lot longer than the original disassembly! A few of the retaining nuts were located in spots where fingers could not go. The same was true of the tapped metal plates that serve as nuts for the two handles. The handles could have been installed with ease had I been smart enough to put them on before assembling the panel to the chassis. That'll teach me to make better notes next time I dismantle a set!

## ❖ Power Supply Considerations

With the panel back in place, I turned my attention once more to electrical issues. There is still finish restoration work to be done on the knobs, but I decided to wait until the next work session to complete that and reinstall them.

What I wanted to do now was to decide on where to put the a.c. power supply for the radio. Some restorers choose to build the supply into the well formerly occupied by the dynamotor. Others prefer to locate the supply outside the set, connecting it to the innards via an umbilical cord. I would have preferred the inside location, but the size of the parts available in my junk box dictated otherwise.

As mentioned earlier, a previous owner had rewired the heater circuits of this radio to operate from 6 volts rather than the original 24. All of the tubes are actually 6-volt types, but had been wired in a series/parallel arrangement to arrive at a 24-volt input. I decided to leave the wiring change in place so that I could use a standard receiver power transformer in my supply.

To match the output of the original dynamotor, the B plus supply would have to deliver about 225 volts at – I would guess – about 100 ma. As it happens, the receiver transformers I had that would fit comfortably in the dynamotor well fell short of a 100 ma. rating. The ones that would provide at least 100 ma. were too big.

I don't know how many of you have priced out new transformers at one of the antique radio supply houses. Those who have done so will understand why I decided to go with something that I already had on hand. Ergo – my power supply would have to be external.

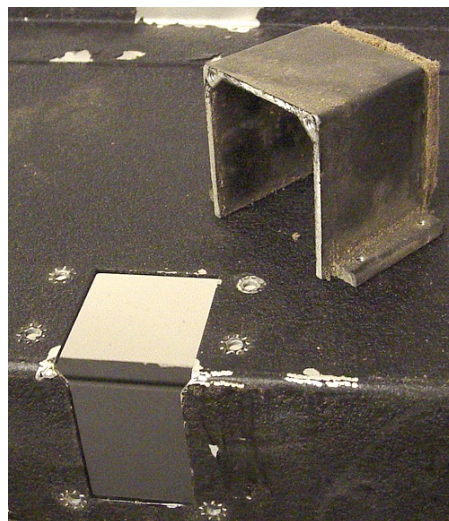
Having decided that, I would have to figure out how to get the wires from the power supply into the cabinet without drilling a hole. There were no ventilation holes or other existing cabinet penetrations I could use. The receiver's connections to the outside world are normally made through a male plug that does exit the back of the cabinet, though there are no openings around it that might provide a route for my wires.

I didn't want to remove the plug or modify its wiring in any way. However, I noticed that the aluminum casting surrounding and sealing off the plug could be removed from the cabinet by taking out six screws. Doing that created an opening under the plug through which I could pass the wires. I plan to tape the casting and a packet containing the screws to the floor of the empty dynamotor well – along with a note explaining where the piece came from.

## ❖ Setting Up the Connections

Without worrying too much about the design of the power supply I would eventually put together, I decided that I would now install the connecting wires. These would be individual wires that would be about 18" long after passing out of the cabinet. Of course they'd be sized appropriately to carry the expected currents. Eventually they would be bundled into a cable and fitted with a plug for connection to the supply.

As previously mentioned, an earlier owner had removed the original screw-terminal power connection strip along with the dynamotor and brought the leads to unused lugs in a terminal strip at the back of the chassis. The stubs of the connections that had once gone to his power supply were still soldered to these lugs. I have to admit, it gave me some satisfaction to remove these poorly soldered stubs and replace



*Removal of the connecting plug shield from the inside of the BC-348's cabinet makes it possible to feed in power supply wiring without drilling holes.*

them, one by one, with neatly installed leads of my own. In each case, I double-checked the schematics to make sure that the connection was being made to the correct point.

And speaking of checking connections against the schematic, I want to stress, again, the importance of acquiring a complete maintenance manual before beginning restoration of a BC-348. If at all possible, get one of James A. Moorer's superb scans from his site at [www.jamminpower.com/main/bc348.jsp](http://www.jamminpower.com/main/bc348.jsp). It is well worth the long download time.

The pictorial diagrams are of particular importance in working on a set where the wiring is almost all enclosed in tight cables. These are the diagrams where the parts and connecting wires are shown as representational drawings rather than schematic symbols. For instance, tube sockets, terminal strips and plugs are shown much as they look in real life. Each interconnecting wire is drawn in position in its cable and may be traced with the help of a straight edge. The draftsmen who produced these incredibly detailed drawings were totally amazing.

Of course, in some situations, you will also have to rely on the standard symbolic schematic drawings – which emphasize the electrical interrelationships between the components rather than how they are connected physically.

I'll be back with you next month, when we'll clean and reinstall the knobs, add a power supply, and conduct a smoke test.

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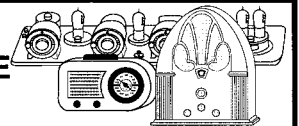
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## Model Motors from Scrap

By Greg May, W2ORO

**A**s a youngster, I remember reading library books illustrating how to build simple electrical projects. In searching the shelves of a modern, suburban, public library I see that times have changed. Perhaps kids aren't as interested in building things, or perhaps adults are overly fearful that children could come to harm if left at a workbench with a complement of tools. Even the staple No. 6 dry cell so indispensable to the young inventor has become obsolete.

My wife, Judy, wanted to experience this joy from the past. We traveled to a library that had kept these grand old books, and gathered up a variety of plans to build model motors (Figure 1). She had a blast building two of them, and now it's my turn. Please remember that the material I will present is not my own; these projects came from the minds of fine authors of yesteryear. I will credit them as sources at the conclusion.

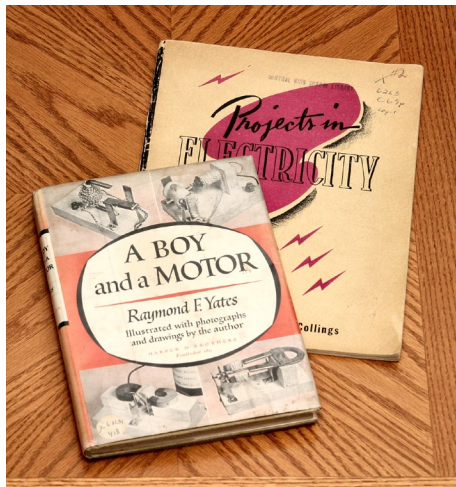


Figure 1. Two old books from the library's basement.

### ❖ The Basics

To begin, I will offer my own advice: in choosing your scrap materials, be flexible and be inventive. Try to use whatever you have laying around. The basic premise of an operational motor is quite forgiving. As long as you are not trying to alter a law of physics, you can be very imaginative in changing these plans to suit your desires.

In the March 2007 issue of *MT*, photos appeared showing the two motors that Judy built. I will present how they were con-

structed. But first I am going to delve into the details of the motor I am building now, so I can offer some photographs of the process. Let's start with some terms:

**Field coils:** the stationary electromagnets. Could be just one if in the shape of a large, flattened "U".

**Armature:** the rotating electromagnet mounted on a shaft.

**Commutator:** the rotating set of electrical contacts mounted on the shaft that deliver power to the armature.

**Brushes:** the flexible metal elements that rub against the commutator to deliver electricity. Arcing will slowly eat away the metal of the brushes.

Winding the wire to produce the field coils and the armature is key to building a motor. In almost every case, there is a core of steel or iron, with many turns of wire wrapped around it. The old books are quite specific that these cores should be made of "soft iron," an antiquated term left over from the 1800s. Suffice it to say that mild steel works fine, so bolts, nails, and rods are ideal as long as they are not hardened alloys. Theory has it that hardened steel would become a permanent magnet inside the coil of wire, ruining the operation. For my motor, I actually tried to obtain the elusive soft iron; a fellow ham, N7TG, gave me a very old piece of iron rod that I am using in my field coils.

The books teach that all coil cores must be insulated from the wire. The universal choice at the time was paper and shellac. I question if this practice is still necessary with modern wire insulation. Judy and I have

chosen to wrap the metal cores with masking tape, and to use thin cardboard on the ends.

Magnet wire is the best choice for winding coils; the thin enamel insulation allows a dense winding. 22 gauge is commonly recommended (Figure 2). I would expect other types of wire would also work. Since I did not have enough wire on hand to build several motors, I found a supplier of 22 gauge magnet wire at [www.mpja.com](http://www.mpja.com) (item number 7254-WI). Sandpaper or an old knife blade can be used to strip insulation from the ends of magnet wire.

### ❖ Construction

The base and the field coil supports are nothing fancy, just scrap 2x4 stock. Specific dimensions are contained in Table 1.

TABLE 1	
Specs and Dimensions for the 1941 Collings Motor	
Field cores (2)	2" x 7/16"
Armature	1-5/8" x 3/4" x 1/8"
Shaft	3"
Wood base	7-1/8" x 3-1/4" x 1-1/2"
Field supports (2)	2-1/2" x 1-1/2" x 1"
Wood commutator	3/4" long x 1/2"

For the armature of my motor, author Collings called for a short length of flat iron, and coat hanger wire for its shaft. A good substitution for the flat iron would be four or five pieces of a "tin" can laminated on top of each

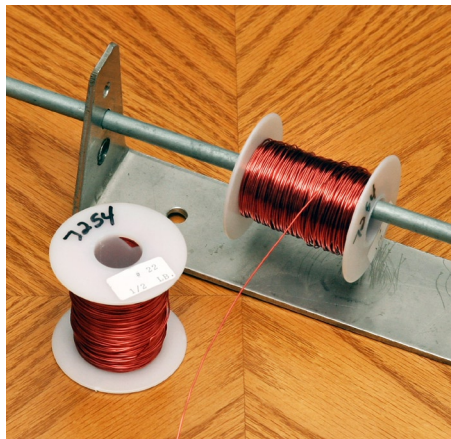


Figure 2. Spools of magnet wire and a simple but helpful holding device.



Figure 3. The soldered armature core and metal supports.



other. For the shaft, cutting the head off a nail could serve instead of the coat hanger wire. After drilling a snug hole into the armature, I soldered in the shaft (Figure 3). Epoxy glue would be a fine bonding alternative.

I cut the iron rod for the field cores, and glued them into holes drilled into the wooden supports as seen in Figure 4. If you were to use bolts, complete with heads, you could just screw them in. For all the gluing on my motor, including the conclusion of the wire windings, I used polyurethane glue (Gorilla Glue). After adding some end caps cut from cereal box cardboard, I began winding. Be sure to leave six inches free for later connections; this free end can be held in place temporarily with a bit of gaffers tape. I wrapped on four layers of wire (30 feet), and applied



Figure 4. Field cores and wooden supports.

a dab of glue to freeze the last couple of turns in place.

To wind the armature, leave three inches free, and begin in the middle. Wind the wire out towards the end and back, giving you two layers on the first pole. Cross over the middle, straddling the shaft, keeping the direction of your winding constant (Figure 5), and complete the second pole. If you wish four layers of wire like I did, cross over again and repeat the process. Mine took 30 feet of wire, making a total of 90 feet used in this motor.

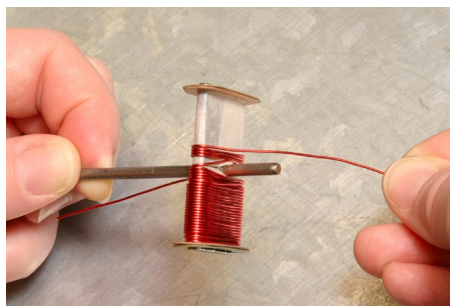


Figure 5. Winding the armature. Note that direction is maintained while crossing to opposite pole.

The commutator is fabricated of half-inch dowel, with two squares of metal glued to it. A hole for the shaft has to be drilled down the center of the dowel (Figure 6). Make it snug with a piece of masking tape applied to the shaft, or glue it in place. The metal may be tin can or 1/2-inch copper pipe. I used a tubing

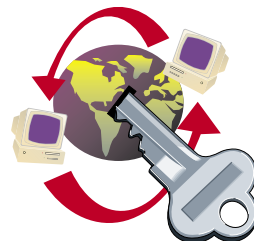


Figure 6. Commutator pieces before gluing.

cutter to obtain 5/8-inch of pipe, and then slit it lengthwise using a Dremel rotary tool with an abrasive cutoff wheel. Metal cut from a food can could have been sheared using tin snips.

### MT READERS ONLY

To access the restricted website for the month of August, go to [www.monitoringtimes.com](http://www.monitoringtimes.com), click on the key, and when prompted, enter "mtreader" under the user name. Your password for August is "tower" – Check in each month for new material!



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The commutator must be properly aligned so that the gaps between the metal contacts are toward the ends of the armature poles. When the glue has cured overnight, the leads from the armature winding can be carefully cut to length, bared, and soldered, one to each commutator contact. This detail is visible in Figure 7.

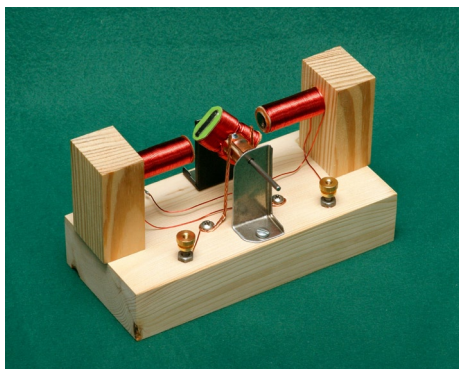


**Figure 7. Completed armature with commutator connected by soldering.**

Supports for the armature shaft can be snipped from metal; I used the case from a discarded VCR. I drilled holes to mount the shaft 1-3/4 inches above the base, so as to be even with the height of the field coils. To secure the wooden field coil supports, I drilled pilot holes up from the bottom and counter-sunk long wood screws, one per coil.

Brushes can be fashioned from any springy metal, from tin can to hookup wire. I have this neat, thick, bare, multi-strand copper wire – I don't know where it came from, but it works great and it's durable. Just bend the shape you need in your material and screw it onto the base. It should lightly ride upon the commutator as the shaft rotates.

I added two wire terminals at the front for connection to the power source. These are simply machine screws counterbored upward from the bottom of the base. To celebrate the completion of construction, I treated myself to a couple brass knurled knobs from the hardware store. The finished model is shown in Figure 8.



**Figure 8. Finished 1941 Collings motor.**

## ❖ Electrical

The wiring is all connected in series per author Collings (the alternative would be a

“shunt wired” motor, in which the elements of the motor are paralleled). So, connect a terminal to a field coil, that coil to the other coil, the 2nd coil to a brush, and the other brush to the last terminal. Before making the connections permanent, experiment for a moment with a magnet or a compass. When power is applied to just the two field coils, the tip of one field coil must be north while the other is south. If this is not the case, reverse the polarity of one of the coils. Otherwise, the motor will not run. In motors like those that Judy built which have only one field coil, this is not an issue.

As a ham, I have picked up a couple of old-fashioned “battery eliminators” from hamfests. These variable-voltage, 10 amp power supplies are perfect to run a motor. Six volts is usually a good starting point. A six-volt lantern battery should also work perfectly. In a pinch, try a few D cells to get your model up and running.

I have included a list of my five favorite motor books in Table 2. These are wonderful old books. The authors delve into more detail, including theory, than I have. Plus, there are additional plans contained within their pages.

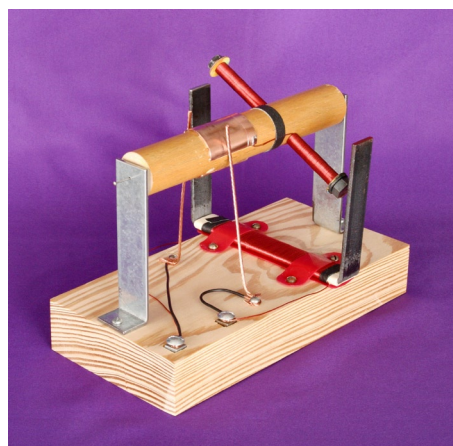
**TABLE 2**

### Out-of-Print Books

*Projects in Electricity*, Merle D. Collings, 1941  
*A Boy and a Motor*, Raymond F. Yates, 1944  
*Fun with Electricity*, Tom Kennedy, Jr., 1961  
*The World Book Encyclopedia*, 1968, Vol. E, “Electric Motor”  
*Easy to Make Electric Gadgets*, Leon Stanley, 1980

## ❖ Judy's Motors

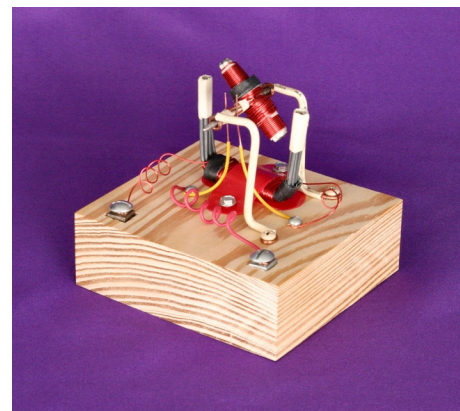
The two motors that Judy built both utilize a single field coil bent into a flattened “U” shape. The first one, from plans in the 1968 *World Book Encyclopedia*, employed a wooden broomstick for the motor shaft (Figure 9). A five inch long bolt passed through the shaft to serve as the armature, and sewing pins were stuck in the ends of the shaft to



**Figure 9. Judy's first motor, the plans coming from the 1968 World Book Encyclopedia.**

serve as bearings for the metal supports. The field coil was flat steel 3/4-inch by 1/8-inch, strapped in place using screws and plastic pieces cut from the lid of a peanut can. She put 20 feet of wire on the armature, and another 20 feet onto the field coil, but for a motor this massive you could double that amount of wire and probably see improved performance. For the commutator, she cut squares from 3/4-inch copper pipe; the copper pieces were glued to the wood dowel using epoxy glue.

Her second motor, from Stanley's book, was simpler to construct (Figure 10). For the armature and the field coil, the plans specified 12 gauge soft steel baling wire, which she happened to have. Wire from standard old clothes hangers would be an almost identical substitution. The core of the field coil is made of six lengths, each 5 inches long. Bundle them together tightly, and tape the bundle heavily on the ends with 1/2-inch masking tape. Then bend it into a “U” shape.



**Figure 10. Judy's second motor, made literally from scrap wire and masking tape.**

For the armature, six lengths of steel wire, 1-1/2 inches long are bundled with tape. A nail, about 2-1/2 inches long, is stuck through the center of the bundle to form a cross and is secured using diagonal strips of tape. This serves as the shaft. 15 feet of wire was wound onto the armature, and 15 feet onto the field core.

For the commutator, build up the diameter of the shaft by wrapping a 2-inch long piece of masking tape around it. The bare ends of the armature wire are then carefully laid on top of the masking tape, making a couple of sharp U-turns. These become the commutator contacts, and are held in place with narrow, 1/8-inch strips of tape at each end. The two shaft supports were simply bent from 12 gauge copper house wire using needle nose pliers. 18 gauge copper hook-up wire was springy enough to constitute the brushes.

Whether building a motor with a youngster at your side, or just bringing out the youthfulness of your own heart, these models can be fun. With the added benefit of being educational, a small project like this can remind us of the basic principles important in understanding electricity, and how they were presented to young minds of yesteryear.

## Cambridge SoundWorks 820HD AM/FM HD Radio Receiver

By Ken Reitz

**C**ambridge SoundWorks (CSW) is one of those innovative audio companies from the talent-rich area around Boston. It's no surprise then that CSW has entered the HD Radio fray with a product that continues the tradition of merging style and sound. As a stand-alone table radio, the audio is on par with any, including the much hyped Bose Wave Radio. Using the digital output from the 820HD's tuner direct to your stereo, via the fiber optic cable output, the audio is unparalleled. It brings any older stereo with fiber optic input immediately into the 21<sup>st</sup> century.

### ❖ Sounds as Good as it Looks

The 820HD is not a big radio. At a little over a foot wide, just 7.5" deep and only 4.5" high, this radio gives the impression of being a normal table radio, but at 8 pounds the 820HD is a weighty package of heavy duty speakers capable of filling a large room with real audio fidelity. From the heaviest bass intro to the final symbol crash, you won't miss a thing. That's the legacy of Cambridge SoundWorks products. If you've not heard them before – from earlier analog radios to their acclaimed loudspeakers – your ears are in for a treat.

The molded, shiny black cabinet is sealed to project the audio from the two front fired speakers and the molded bass port on the back. Making the most of only two multi-function knobs, the 820HD also uses micro switches on the front panel and a variety of ports for optimum flexibility.

Want the best possible sound from your iPod® or other MP3 player? Hear what's been missing from those dinky ear buds when you

plug it into the auxiliary port on the 820HD's side.

The slightly oversized remote control performs all front panel functions including direct entry tuning, station presets (up to 30 AM and 30 FM), seek/tune buttons and a switch to go from digital to analog tuning for those HD Radio stations that don't quite lock on.

### ❖ Tuning with the 820HD

AM reception on all of the HD Radios I've tested in the last year has not been impressive. Since this spring, when the FCC dropped its ban on AM HD Radio broadcasts at night, I've been hoping to be able to tune AM HD DX. While I can get the HD symbol on several models to flicker, indicating that it's sensing an HD Radio signal, none have been able to lock on. Daytime reception has been little better. One reason for both is that only a few hundred AM stations across the U.S. are currently transmitting an HD Radio signal. I have been able to lock onto one local AM HD Radio station some 60 miles away during daytime listening.

FM reception on the 820HD is typical of a radio in its class: it's good but it's not a "DX machine." There is no built-in AM ferrite loop antenna and no built-in FM antenna. The 820HD comes with a small non-tunable AM loop, a screw-in telescoping FM antenna, and a folded dipole wire FM antenna, all of which are of marginal use outside of most urban or suburban locations.

CSW advises that AM reception can be improved by using a tunable AM loop antenna in conjunction with the small loop. Not really. AM reception, even with a tunable loop added, was



*Rear view of the arctic white 820HD: minimal design and maximum sound. (Courtesy: Cambridge SoundWorks)*

not as good as, for example, Polk Audio's iSonic HD Radio. FM reception in a rural location is only optimum with the addition of an amplified Yagi antenna mounted at 30 feet on a rotatable mast.

### ❖ Final Word

Cambridge SoundWorks 820HD is a full-featured, beautifully designed, solidly built, HD Radio with unequaled audio. For playback of MP3 or streaming audio from your computer the 820HD delivers full-bodied sound which can fill a large room. Hooked up to a decent FM antenna and connected through the fiber optic audio cable to your stereo you'll get the best that today's FM multi-casting and HD Radio has to offer. At \$299.99 the 820HD is a better product at a far better price and with more features than the much advertised, non-HD capable, Bose Wave Radio II.

### WHERE TO BUY:

Cambridge SoundWorks 800-367-4434  
[www.cambridgesoundworks.com](http://www.cambridgesoundworks.com)  
\$299.99



*Front view of the onyx black Cambridge SoundWorks 820HD: stylish sound for HD Radio reception. (Courtesy: Cambridge SoundWorks)*

### MANUFACTURER SPECIFICATIONS

#### Cambridge SoundWorks 820HD

##### Dimensions:

4.5" H x 13.25" W x 7.5" D

##### Weight: 8 lbs.

##### Tuning Range:

AM 530-1710 kHz

FM 87.5-108.1 MHz

##### Station Presets: 10 AM 10 FM

##### Additional Favorites: 20 AM 20 FM

##### External ports:

75 Ohm FM coax antenna connector

3.5 mm AM antenna connector

3.5 mm stereo headphone connector

3.5 mm Aux. Input connector

Toslink fiber optic audio connector



# MT REVIEW

## MFJ Model 1623 Window/Balcony Mount Antenna

By Ken Reitz KS4ZR

**O**f the hundreds of thousands of hams and SWLers in the US, many thousands live under the oppressive rules of Home Owner's Associations or restrictions imposed by landlords, neither of which allow them to put up the antennas they'd like to have for their hobby. Many have found ways around such restrictions by using antennas disguised as flagpoles, black wires dangling out of apartment windows, and an assortment of commercially made antennas. Among those solutions are two from MFJ Enterprises – the models 1622 and the 1623.

### ❖ Laborious Procedures

The main difference between the two units is that the model 1623 has an attached antenna tuner with RF meter and costs \$199.95. The 1622 does not and costs \$100 less. If you have an older rig, you may benefit from the attached transmatch, but if yours is a newer transceiver with built-in antenna tuner, you would want the 1622. I tested the 1623 with and without the transmatch in several combinations with my transceiver and with a portable shortwave radio in two different locations: downstairs using a deck railing and upstairs using a window.

**MFJ-1623 Window/Balcony Mount Antenna features a 12' telescoping whip antenna, built-on antenna tuner, and retails for \$199.95. (Courtesy: MFJ Enterprises)**



Because this antenna may be used in close proximity to where people are likely to be (e.g. a deck), you'll need to review all the warnings MFJ has scattered throughout the slim owner's manual concerning touching the antenna element during transmitting, touching both counterpoise and antenna terminals while transmitting, possible arcing between the counterpoise and antenna terminals, stray RF in the shack, where to string the counterpoise wires (under rugs or carpets, they suggest), various grounding issues and last, but certainly not least, using the included safety rope so that, in event the antenna falls off your



**MFJ-1622 Apartment Antenna covers 40 through 2 meters has smaller telescoping whip, no tuner and retails for \$99.95. (Courtesy: MFJ Enterprises)**

balcony or window, the antenna won't hit anyone. You may get the feeling that this antenna is not easy to live with.

But, here's another problem: In order to transmit using this antenna, you'll need to set it up manually in a different configuration for each band you operate and, depending on how big the band is, different frequencies within the band. This procedure involves adjusting the antenna, counterpoise, and matching knobs as well as the loading coil jumper wire each time you switch bands. Not exactly user friendly. If you do go to all that trouble, I'd recommend using bits of colored tape to code where those settings are for each band you use.

Further, the review unit I received had quite a few items left out of the manual. There was no picture depicting the assembly of the unit and no mention of the loading coil or explanation of the coil tapping wire and how it's used. The coil and tap wire is essential to getting any kind of signal out of this antenna. I found that it was kind of like using a cat's whisker on an old Galena crystal radio set. This would be a real problem for beginners who need more instruction than is provided.

### ❖ Other Limited Space Options

The thing I liked best about this antenna was the general construction and components used. For instance, the mounting bracket was made of stainless steel and could be used in a number of configurations, depending on your window or balcony. The 12-ft telescoping whip with 3/8" x 24" threaded stub (MFJ-1956) can be bought separately for \$29.95 and used in a number of interesting antenna projects. So that got me to thinking about other limited space options which

may work better, particularly for SWLers.

The MJF-1020C Active SWL Antenna (\$89.95) is much smaller, cheaper, and very easy to use (see my review *MT* Aug. 2002). It's a better choice for SWLers because it has an antenna pre-amplifier built-in and the antenna can be detached and an external antenna of your choice connected.

**MJF-1020C Active SWL antenna is a better choice for SWLers with limited space. (Courtesy: MFJ Enterprises)**



In the September 2006 issue of *MT* I reviewed the MJF-932 Mini Loop Tuner, which uses a loop of wire or copper attached to a tuner which makes the loop resonate on the band for which the loop is cut. At the time I speculated that the 1622 might be a better choice, but after having used the 1623 with attached tuner I have to say it's not. The big advantage of the loop is that it can be rotated for maximum signal – something that you can't do with a vertical such as the 1622 or 1623.

### ❖ Final Word

Using either of these products is not easy. Having to re-tune the antenna for each band change can be a pain, finding a suitable place to mount either antenna is not easy. Those who will find success with either of these two products will be dedicated radio enthusiasts indeed. If you operate QRP (low power usually under 10 watts) on one frequency per band such as is common on PSK31 mode, this antenna may be more user friendly.

Remember, too, that no small antenna operated at low power can overcome poor band conditions, and we remain at or near the bottom of solar cycle 23. But, in the next 12 months band

conditions will rapidly improve, and if you live in an apartment or condo, products such as the MFJ 1622 or 1623 may make the difference between staying in the radio hobby and giving up.

## ❖ Specifications

According to the manufacturer, this unit tunes 80-6 Meters, though if the telescoping whip antenna is extended to its full 12 feet you won't have much of a signal on 80 meters. Maximum power capability is said to be 200 watts, but at such high wattage there could be considerable RF in the area of the antenna as you attempt to tune it.

The air-wound "bug catcher" style antenna loading coil is 8-3/8" long and 2.75" in diameter and has 50 turns. There is a 3/8 x 24 threaded stub at one end and a 3/8 x 24 threaded socket at the other and an alligator clip tap to adjust the resonance. Three counterpoise wires of different lengths with attached washer terminals are provided.

The counterpoise and antenna terminals at the top of the unit have several washers and lock washers and are kept in place by wing nuts. The terminals are mounted on a fiberglass plate which is inset into the top of the case. While unloosening the wing nuts it's easy to let all the washers fall into the recess. You'll need a magnet to retrieve them.

Telescoping Antenna: 12' (23.5" collapsed)  
Cabinet size (Tuner/RF meter): 2.5"(H) x 7.5" (W) x 3" (D)  
Weight (including antenna/mount and tuner): 6 pounds

# NetWorks and NetWorksGo from Tivoli

By John Figliozzi

Most of us reading the coming ads for these new products from **Tivoli Audio** likely will experience a *deja-vu* of sorts. "Travel the world and never leave home behind" reads the publicity sheet for *NetWorksGo*, Tivoli's portable internet/FM radio which – along with *NetWorks*, Tivoli's internet/FM table radio – is scheduled for a late 2007 release.

Yes, these descriptions formerly reserved for shortwave are now being applied to internet radios. And radios they are. There's no need to boot up the computer. With a wireless (WiFi) or Ethernet internet connection, thousands of radio stations – including many HD multicast and DAB – worldwide can be received literally at the touch of a button.

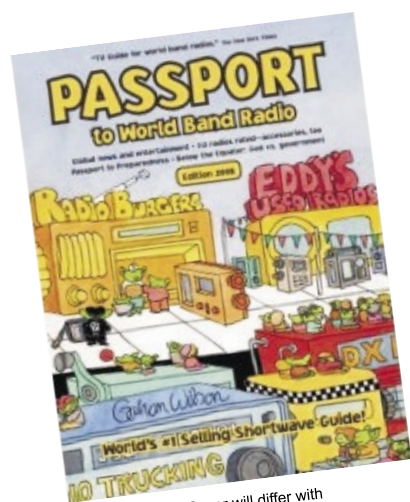
Both *NetWorks* and *NetWorksGo* decode WMA, MP3 and RealAudio and include an easy-to-read backlit display, digital clock, alarm and sleep timers. There's a USB input for connecting a compatible MP3 player or memory stick, a stereo headphone output, and an auxiliary input for iPod or similar audio device. Internet stations may be browsed by country and genre and selected via preset, menu or direct input of a station's call letters. Music files can be streamed from your PC and each model's software is easily and fully updateable as upgrades become available.

The *NetWorks* table radio is housed in a furniture grade wood cabinet with a 3-inch magnetically shielded full range driver. A right channel output allows for an optional matching stereo speaker and a compact remote control is included.

The *NetWorksGo* travel model goes a big step further by making internet radio truly portable. Along with its WiFi reception capability, six "C" cell batteries and a built-in charger for use with NiMH or NICADs provide for up to twelve hours of use without resort to mains power. It has a 2.5-inch magnetically shielded full range driver in weather-resistant housing with rustproof hardware.

And for those progressively fewer occurrences when internet access is not available, there's FM and FM RDS Data System reception with manual and auto seek tuning.

Release date is late 2007 and the retail price is yet to be determined. At the new product demonstration I attended in New York on June 22, each radio easily ping-ponged around the globe and provided a rich, full audio experience. I already know what I want for Christmas.



Cover will differ with new edition

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# Vox Radio Populi

## PC Digital Audio Recorder Programs

**R**ecording audio from our radio monitoring efforts can be useful and rewarding. Listening to recorded radio transmissions of a historic event can instantly transport you to the feelings of the past. Listening to my recording of the immense amount of chaotic radio traffic at the onset of Desert Storm 1 brings me back to the fears and concerns that we all shared at the beginning of that conflict.

Recording of non-world changing events can still hold personal importance. I recently found an off-air recording made by a friend of mine who always had five scanners tuned to commercial aircraft frequencies. It was of me and my Dad, flying a Cessna above Syracuse, NY, in the 1970s. We were in radio contact with Hancock Airport's Approach Control and Tower. So much has changed since that fine VFR day.

### Hello 1s & 0s

Unattended recording of programs and intercepts, whether on shortwave or VHF/UHF, while we are away from our radios, is an excellent use of automated radio audio recordings. But recording technologies have changed drastically since I first recorded Radio Canada International's DX program in the 1970s on reel-to-reel tape.

Today, using magnetic tape for analogue audio recording is as common as using a spark gap transmitter. Back in 1985, Philips launched the digital revolution in music with its introduction of popular music on Compact Disc, CD. This was the death knell of cassette tape and analogue audio.

With the advent of dedicated chips for digitizing audio, the development of audio compression formats, and the fall in prices of memory chips, today's portable digitized audio is for everyone. Did you ever hear of an iPod or MP3 player? These are digitized audio devices.

If you have a modern PC sitting in your radio shack for logging, radio control, or whatever, you already have the makings of a digital audio system that you can use for your radio monitoring. Let's look at some useful digital audio recording programs.

We used a PC with a 1.6 GHz Duo Core T2060 CPU, 1.4GB of RAM with a Vista Home Basic operating system for trying out our audio recorder programs. Once again we will see that Windows Vista provided us with some "interesting" situations. Nothing serious this time, just annoying.

### ❖ RecAll Pro

The RecAll Pro program from Sagebrush

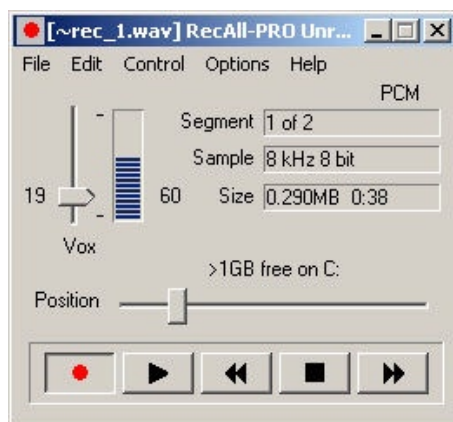


Figure 1 – RecAll Pro Audio capture software from Sagebrush

can be categorized as small and simple and super! Figure 1 shows the simple small box that appears when the program is started. The vertical Vox slider setting of 19, at left, means that the recorder is activated when the signal's audio level is above 19. Vox is Latin for voice, but it is a common acronym for voice-operated relay (don't ask me where the X came from).

The vertical bar next to the slider displays the audio of our radio transmission. Here we can see it is at 60, so we are recording. There is quite a lot of control and data functions in this small box.

From the Options-Preferences menu we can further fine-tune the vox parameters, including seconds of silence before recording stops, seconds of audio saved before vox is triggered, and minimum time of a recorded segment. The last feature can be useful in an electrical noise "spike" environment.

From the same menu we can set RecAll Pro to produce a new file each time the recording either stops or starts. Alternatively the user can set the program to generate a new file after a user defined number of seconds of quiet. This mode can be very useful for scanner users trying to catch infrequent transmissions, for example, en-route military aircraft in the UHF band.

RecAllPro version 1.4 has many other features, including: variable playback speed control, mark selection, file annotation and audio file manipulation, such as cut, paste and record insert. A very useful feature for radio monitors is RecAllPro's Report File, which details the date, time and duration of each segment. This is great for pinpointing the exact time of unattended transmissions.

The one problem I did have was not RecAllPro's fault. Using Windows Vista I could not access the help file and was directed to a Microsoft site for a Gates' excuse.

A 30-day trial version of RecAllPro is available at [www.sagebrush.com/](http://www.sagebrush.com/). The registered version costs \$29.95. A lite version, RecAll, is also available.

### ❖ Scancorder

Scancorder, Figure 2, is a basic, but capable digital audio program. The top numeric display shows the current date and time. The display below indicates the elapsed time of the current recording. The function of this display can be changed using the "Arm" button to the left of the display. Using this button, the "start" and "stop" time can be set for timed recording sessions.

On the right is the Vox level control and the input signal level bar meter. From the dot in the vox box and the fact that the input level is above the vox level, we can tell that the program is in the process of recording a transmission. The running stick figure at the bottom left is another indication of recorder operation.



Figure 2 – Scancorder's main screen grabbing audio from a scanner

Scancorder's operation is pretty intuitive with the use of the button labels. Good thing, since once again, due to Vista, the Help file was not accessible.

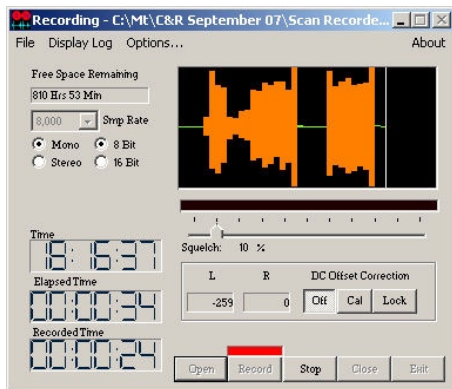
Another useful feature is that the user can generate script files to detail a number of recording times and modes that will be performed without operator intervention. Scancorder, version 1.4 was easy to use and did a very good job of catching hours of scanner transmissions.

You can download Scancorder at [www.coaa.co.uk/scancorder.htm](http://www.coaa.co.uk/scancorder.htm) and use it for 15 days for free. After that it will cost you 25 Euros.

### ❖ The Sound Recorder

Next up is Sound Recorder version 1.9, a freeware program whose name sounds a bit like the program we just looked at. As indicated on its

website at [www.davee.com/scanrec/](http://www.davee.com/scanrec/) this program was designed with radio monitoring in mind. Their site states, "Since FM communications has such an effective squelch, the recorder works best with FM. HF ham bands and World Band radio have such a poor signal to noise ratio that the VOX gate on Scanrec might not be very easy to set."



**Figure 3 – Scan Recorder doing its thing**

In our limited tests, noise on the HF band caused many false record starts. However, its operation in the VHF/UHF bands with a scanner was very good.

Figure 3 shows Sound Recorder in idle (not recording). However, you can see from the peaks in the spectrum that it has just received and recorded two transmissions. The current signal level, or lack thereof, is indicated in the horizontal bar below the spectrum graph. The user-set squelch level is below this and is currently set at 10%.

An interesting feature of Sound Recorder is its Free Space Remaining display. Here it shows that if I use all of my remaining hard drive space I could record 375 hours and 59 minutes of transmissions. That represents about 23 GB of hard drive space.

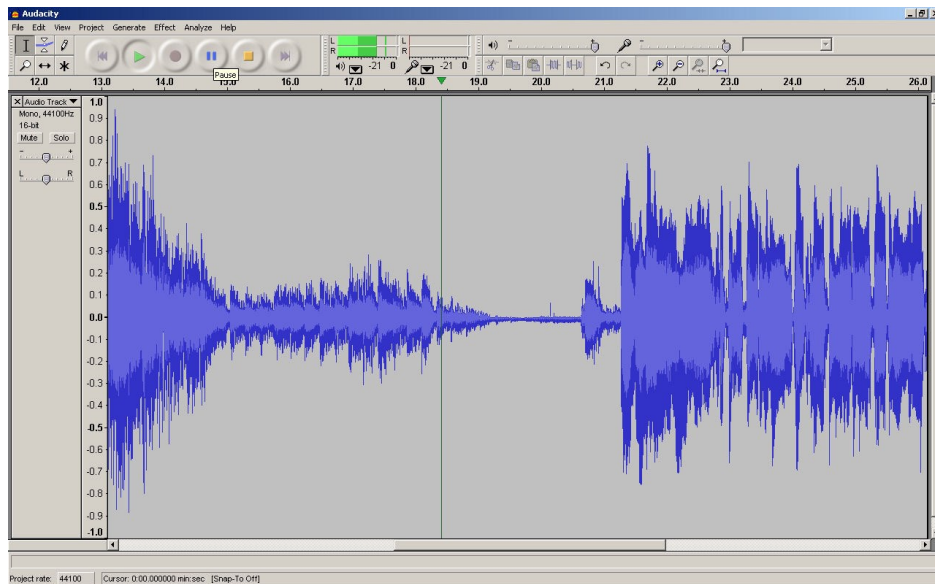
A data compression option and a simple, but useful, Log function, rounds out the features of Scan Recorder version 1.9. Give it a try at the above website. Since it's a freeware program, what do you have to lose?

## ❖ Snooping Around

This next program, Snooper, works well for radio monitoring applications, but also is designed for dictation and Email sound files. Vox



**Figure 4 – Snooper's deceptively simple screen**



**Figure 5 – Audacity, not quite radio friendly but a free useful audio lab**

recording, with an adjustable recording window that starts recording before and after the trigger sound, and timed recording is a nice touch of Snooper version 1.35.35.

On the left side of Figure 4 is Snooper's deceptively simple main screen. Mode lights and recording details are shown at the top. On the left is the now familiar input signal level display and the Vox or Trigger level control.

The recording mode is selected from the center region, and typical record controls are near the bottom of the screen. A running readout of the current file size in kB and the file's size in time is at the very bottom. Those are all the controls a basic user needs to use Snooper.

But to show the depth that an advanced user can go to, we have displayed the Option-Audio screen on the right side of Figure 4. Here the Input level of the amplified can be adjusted. MP3 and sampling settings can be modified. And finally we see that the Vox or trigger parameters can be customized. On the left of this screen, we can see a list of the other five Option screens that can be accessed. See what I mean about the deceptive simplicity of the main screen of Snooper?

You can download Snooper version 1.35.35 and use for free for 30 days. \$15 will get you a registration key that will remove the time limit.

## ❖ What Audacity!

Another sound recorder that you should

definitely know about is Audacity. This free program does a great job of audio record, playback and analysis from just about any source. It has simultaneous multi-track capability, which allows most PCs to simultaneously record two tracks without any additional hardware.

The audio editing features of Audacity version 1.2.6 are excellent, making audio editing as easy as text editing. This program has many features, including more than twenty effects that can be added to saved audio. Figure 5 displays a previously recorded off-air file. Notice the clear breaks in transmissions when the graph goes to zero.

The one thing Audacity is missing, unless I missed it, is a voice activated record function. Except for that one important exception, critical for radio use, Audacity would have scored very high in my book.

A feature in Audacity called Silence Finder can be used to automatically label tracks based on seconds of silence. The user can set the "quiet time" sensing period, from 0.1 to 5 seconds. Therefore, it could be used to generate a track for each transmission or sets of transmissions received.

If you are interested in digitized recording of any type you should really give Audacity a try. It's a free download from <http://audacity.sourceforge.net/download/windows>.

## ❖ That's It

Well, you should be able to find an audio recorder program to your liking from the ones we have tried. Since most have a free trial period or are freeware, give them all a try to find the right one for your radio monitoring. Also keep in mind that many radio software suites, such as Ham Radio Deluxe and RadioMax, include audio recorders. And, finally, remember that most versions of Windows include a basic sound recorder in their Accessories or Accessories-Entertainment folder.

Till next time, remember to take time and "capture the moment."



# What's NEW

## Tell them you saw it in Monitoring Times

### ALPHA Radio

AOR's flagship professional communications receiver, the AR-ALPHA, is now for sale to qualifying agencies. The consumer version (cellular-blocked) should also be available soon.

Covering 10kHz to 3.5GHz with no interruptions, this desktop or rack mount receiver sets new standards for signal monitoring, signal searching, spectrum display, and signal recording. Featuring wideband receive and advanced DSP technology with a high speed DDS local oscillator, innovative ZERO-IF from the 10.7MHz digital processing, versatile 6-inch spectrum scope with FFT technology, stable OCXO, and I/Q output.

In addition to a wide variety of AM and FM modes, the AR-ALPHA also receives and displays analog TV signals in NTSC, PAL and SECAM formats, APCO-25 digital reception and a Digital Voice Recorder that can capture up to 52 minutes of audio and six channels.

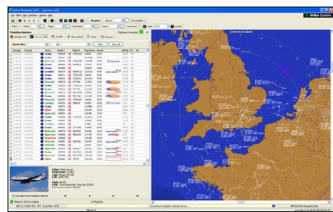
Rear panel connections include 12 VDC power, RS-232C, USB 2.0, I/Q output with 1 MHz bandwidth, two antenna ports (one SO-239 and one Type N) and up to four antennas may be selected through the receiver's controls with the optional AS5000 antenna selector.

Street price for the AOR AR-ALPHA is \$10,000; no price is yet available for the consumer model. For more information in a full-color brochure, visit [www.aorusa.com](http://www.aorusa.com) (email [info@aorusa.com](mailto:info@aorusa.com) or call 310-787-8615) or [www.grove-ent.com/aorprofreceivers.html](http://www.grove-ent.com/aorprofreceivers.html) (email [order@grove-ent.com](mailto:order@grove-ent.com) or call 800-438-8155).



### AirNav RadarBox

AirNav has announced release of its advanced real-time radar decoder. Thanks to next generation Radar decoding, real world aviation is as close as your armchair. By decoding ADB-S (Automatic Dependent Surveillance Broadcast) radar signals, you will be able to see on your computer what real Air Traffic Controllers see on their screens in Real-Time. Flight number, aircraft type, altitude, heading, speed are all updated each second. Included is the award winning software interface developed by the world's leader in flight tracking and monitoring solutions, AirNav Systems.

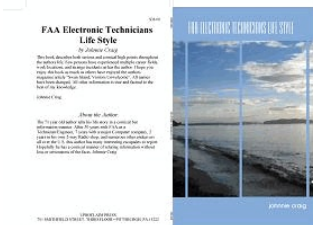


Watch for the review in *Monitoring Times* in October, or go to [www.airnavsystems.com/radar-box](http://www.airnavsystems.com/radar-box) and order yours today for \$899. (S&H included)

### The Rest of the Story

Many *MT* readers told us how much they enjoyed Johnnie Craig's October 2006 story, "Swan Island; Visitors Unwelcome." That article was an excerpt from a book Johnnie was writing, and with your encouragement, he has now finished it.

"FAA Electronics Technician Life Style" spans Johnnie Craig's stint in the military, his 30-year career with the



FAA (the only civilian government job he could find not subject to the draft) which took him across the entire country, including several years in Alaska.

Much of the book focuses on comic or ironic events and Johnnie's continuing search for new challenges (which often turned out to be as much about handling people as technical equipment). As a 10th grade drop-out who ended up being one of the most respected field technicians in the FAA (and who, at age 71, is still on call!), Johnnie rarely did anything "by the book." Johnnie followed his own career advice: "It is very rare to find someone who works hard, tries hard, seeks constant improvement, and is not successful and reasonably happy. Invariably, people who are unsuccessful, got side tracked, stopped trying to improve, or just decided to settle for what they have."

"FAA Electronics Technician Life Style" is a slim 44 pages of good reading. If there is a criticism, it is that it is priced like a technical reference book, instead of the entertaining and informative autobiography it is. "FAA Life Style" can only be purchased on line at [i-proclaimbookstore.com](http://i-proclaimbookstore.com) with major credit cards. (There seems to be no provision to order by mail or by phone.) For \$33, you may download the book in Adobe Acrobat, or you may purchase the published book for \$38.00 plus shipping (\$5.75 to most addresses).

### Sound Archives

Radio hobbyists fascinated by sound (and who isn't?) will get a kick out of a new website called Soundsnap. This site contains thousands of sound snippets free for the downloading. Like YouTube, users can also upload their own sound files to add to the library.

Soundsnap audio files are free to be used by sound designers/recordingists and music producers, film-

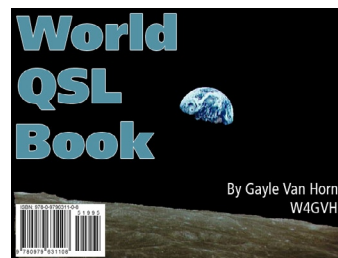
makers, web designers and video game developers. It can also be useful to hobbyists for their home videos, people looking for ringtones and anyone else that needs sounds. (Pirate radio and radio drama come to mind...) Soundsnap was started by Tasos Frantzolas, a young sound designer living in Athens, Greece.

I searched on "radio" and found sounds from CB, scanners, shortwave, and mediumwave, but the site hasn't even scratched the surface when it comes to interesting sounds on shortwave. *MT* readers, this site needs you! Check it out at [www.soundsnap.com](http://www.soundsnap.com)

### World QSL Book

Teak Publishing has announced the release of its first e-book – *World QSL Book*, 1st edition. The book is written by *MT*'s *QSL Report* columnist Gayle Van Horn, W4GVH, and represents the first comprehensive publication of its kind devoted to QSLing radio stations in the HF radio spectrum.

*What's New* will run a full review of the book, published in Adobe Acrobat (PDF) on CD-ROM, next month. However, just knowing the book runs 475 pages in length guarantees that it is loaded with station addresses, internet websites, and email addresses. Coverage includes shortwave broadcasters (including clandestine and pirate stations); HF utility stations (civilian and military); and amateur radio QSL bureaus worldwide.



*World QSL Book* e-book is available from Teak Publishing, P.O. Box 297, Brasstown, NC 28902, [teakpub@brmemc.net](mailto:teakpub@brmemc.net). It is also available from Grove Enterprises (800-438-8155). Cost is \$19.95 plus shipping and handling. Contact Teak Publishing at the email address above for additional ordering information.

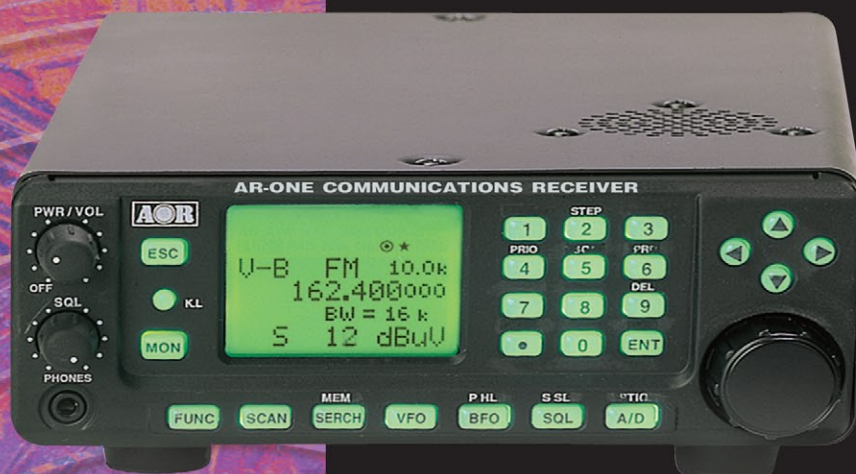


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